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TAPPI Elects Brawn As New President

NEW YORK—Registrations that had passed thirteen hundred by midweek, with luncheon tickets over the 1200 mark at the same time signaled the success of the Technical Association of the Pulp and Paper Industry in setting up a program that commanded the interest of a broad section of its membership. At the annual meeting, held on Monday, the affairs of the Association were discovered to be in excellent shape. President Nicholson's report, printed at length elsewhere in these pages, and the more detailed accounting of Secretary-Treasurer Macdonald both recited facts that measured a substantial increase in the interests and in the financial affairs of TAPPI. Worthen E. Brawn, of the Pejepscot Paper Company, vice-president of the Association, was elevated to the presidency.

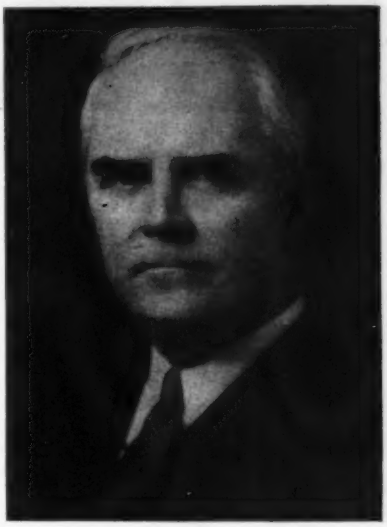
W. F. Gillespie of the Gaylord Container Corporation was elected vice-president. K. P. Geoghegan of the Howard Paper Mills was again elected to the executive committee, for a three-year term. Other members elected for the same period were J. D. Davis of the Dill and Collins Division of the Mead Corporation; Allen C. Hill, of the Gaspesia Sulphite Company, and Ralph A. Wilkins, of Bird & Son. Elected for a two-year term was Werner Kaufman, of Kupfer Brothers.

As these lines are sent to the press it was indicated that a record crowd would be present at the annual TAPPI banquet on Thursday at the Commodore. On Tuesday night, when sales had last been audited, more than 1200 tickets had been sold for the affair, which always draws a substantial crowd of later arrivals. The speaker was to be Dr. Gerald Wendt, editor of Science Illustrated.

Tissue Association Names Grant President for 1947

NEW YORK—E. E. Grant, president of the Crystal Tissue Company, Middletown, Ohio, was named president of the Tissue Association, Inc., at a meeting of the board of directors at the Waldorf-Astoria this week. A. B. Hanson, president of Northern Paper Mills, Green Bay, Wis., was made vice-president, and R. W. Sweet, president, Sweet Brothers Manufacturing Co., Phoenix, N. Y., was elected treasurer of the group. Ross A. Fife was reappointed secretary of the association.

Reuben B. Robertson Reelected By American Paper & Pulp Assn.



Blank & Stoller

REUBEN B. ROBERTSON
Again Heads A.P. & P. A.

NEW YORK—Reuben B. Robertson was reelected president of the American Paper and Pulp Association at the business meeting which on Thursday brought to a practical close a busy four-day period of meetings of the paper industry. The annual convention of the paper interests had opened on Sunday and, in a series of group meetings that lasted through the week, had reached its full stride by Monday. More detailed accounts of the proceedings at some of these meetings will be found elsewhere. The over-all picture was one of an industry which is now facing many problems of reconversion and is doing its best to meet all of the demands that are made upon its facilities.

The highlight of the week's program was the series of luncheons which began with that of the salesmen on Tuesday, continued on Wednesday with the A.P. and P.A. Luncheon, and closed on Thursday with that of the Technical Association. The first two were held at the Waldorf Astoria. The latter was at the Commodore.

S. G. Coburn of the Brown Company was elected to the directorate of the A.P. and P.A., replacing Robert Wolf. Other officers and directors were returned to their posts at the annual meeting.

In his talk delivered informally at the annual meeting, President Robertson, after touching lightly on recent problems of the industry, reminded his audience that a sellers' market always involves danger. "High costs" he said "have a most painful stability." He also suggested that inflationary trends invite government control, and reminded his audience that it is far better to have them self-imposed and voluntary rather than mandatory.

"Many of the problems which we must face, said Mr. Robertson, "can be intelligently faced only when factual data is available, and our Association feels that it is especially its responsibility to see that that factual data is assembled and made available for members' use.

"During the past year the Association has distributed to its membership a wide range of information covering such subjects as capital and income surveys and industrial relations sur-

(Continued on page 163)

Paper Advertising Association Elects Faulkner President

NEW YORK — Advertising is being called upon more and more to do many jobs never considered in its traditional role, Cy Norton, of the Association of National Advertisers, said Tuesday, before the annual luncheon of the Paper Makers' Advertising Association, at the Lexington Hotel. The outlook for advertising is bright, he said, but it is faced with a selling job.

The following association officers were elected: Richard A. Faulkner, International Paper Company, president; Bradley E. Stafford, Strathmore Paper Co., vice-president; Frank Gerhart, Hamilton Paper Co., western vice-president; R. F. Walter, Chemical Manufacturing Co., treasurer; and Richard Fay, Marvellum Co., sec.

Blotting Paper Group Elects

NEW YORK—J. J. Hallowell, Wrenn Paper Company, was elected president of the Blotting Paper Manufacturers Association during an informal luncheon meeting held Tuesday by the Association at the Waldorf-Astoria.

Amos Pays Tribute To Labor Relations

NEW YORK—"Industrial relations in the paper industry have continued on a high plane in the post war period," E. G. Amos, Secretary of the Industrial Relations Committee of the American Paper and Pulp Association, told members of the Tissue Association this week. "Very few strikes or work stoppages have occurred since V-J Day despite the high percentage of organized plants in the industry. (About 80 per cent of the primary pulp and paper mills are organized.) There are several reasons for this, among which is the attitude of union leadership as well as management policies. High wages are general throughout the industry and there is generally no incentive on the part of union members to participate in so-called wildcat strikes.

"The production record of the paper industry," continued Mr. Amos, "is one of the results of the no-strike record, and we believe everyone concerned can take a great amount of pride in the fact that production was almost fifty per cent greater in 1946 than it was in 1939. This record, compared to most any industry you can name, is one that makes us all feel proud.

"This record, both in production and union cooperation, however, should not lull any to sleep, nor should we ever cease to be on the alert for harmful legislation that might be passed and thus upset the relations that have been good so long. Neither should we, as an industry, be afraid to back legislation that will knock out present legislation that serves only to confuse both management and labor. Examples of this are found both in the Wagner Act and the Wage Hour or Fair Labor Standards Act. While labor as represented by the unions will resist and does resist any changes in these Acts as a matter of principle, they are not inwardly or conscientiously opposed to clearer laws and more intelligent interpretation of the same.

"Wages have gone up, of course, at a rapid rate and we are now paying common labor as much as we paid machine tenders a few years ago. This, of course, has boosted production costs to new heights and is something that may become hard to live with if production and demand start on a decline. It is always much easier to hike wages than it is to lower them, and the wise labor leader as well as the mill manager will not let things get too far out of line.

"Trouble could come also with any drastic change in Union Management of our predominant unions, but for the moment it appears that we are in for some good years insofar as industrial relations is concerned."

Blackstone Studios

ELMER H. JENNINGS
Chairman, Glassine and Greaseproof Manufacturers Association

W. B. Snow To Head Paper's Coated and Processed Group

NEW YORK—The Coated and Processed Paper Association elected W. B. Snow, Middlesex Products Corporation, president of their association succeeding James T. Cronk, Hampden Glazed Paper and Card Co., who served as president for the past two years. Dr. Werner Kaufman, Kupfer Bros., was named vice-president of the manufacturing division for the ensuing year. Spurgeon F. Barndt, Wyomissing Glazed Paper Company was chosen as member of the executive committee for the term expiring February, 1949.

Merchandising member of the executive committee for the term expiring in February, 1949, is Ralph H. Lauem, Bradner Smith & Company, Chicago. Other members of the executive committee are Lee R. McDevitt, Blackstone Glazed Paper Company, Pawtucket, R. I., as a manufacturing member, and Charles H. Hoffman, of Hughes and Hoffman, New York City, as a merchandising member, the term of both expiring in February, 1948.

The following arbitration committee was announced: Robert C. Adams, The Marvellum Company, Holyoke; F. Allan Barr, Holyoke Card & Paper Company, Springfield, Mass.; George J. E. Buell, Charles W. Williams & Co., Inc., New York; Henry W. Donahue, McLaurin-Jones Company, Brookfield, Mass.; H. H. Loeffler, Kupfer Bros. Paper Company, Chicago. Serving on the auditing committee are Leo R. McDevitt, Blackstone Glazed Paper Company, Pawtucket, R. I., and J. Rudolph Metz, Metz Paper Co., Pawtucket. Arthur A. Thomas, executive director of the association, was renamed treasurer.

Tinker Weighs Facts Before Paper Men

NEW YORK—E. W. Tinker, secretary of the American Paper and Pulp Association, at the annual convention of the A.P.P.A., this week examined the facts and conditions which men of the paper industry now face, and finds every reason to judge them sound and healthy in their implications. Demand is growing on a substantial basis, he finds, quite aside from any temporary inflationary influence. More important, he finds that policies already making their presence felt, are looking to a sound eventual balance between consumption and new supply.

In part, Mr. Tinker explained:

Of primary importance is consideration of future markets. Admittedly this is a matter of some conjecture but there are certain basic known facts that permit reasonably substantiated generalizations. The consumption of paper is one of the best indexes among our commodities of the general standard of living of the people. As educational and sanitation standards advance, so also does the per capita consumption of paper. Business activities, particularly as reflected in certain commodities also bear directly upon the basic demand for paper and paper products.

Considering all of these factors, plus the normal growth of population, I think the pulp and paper industry has justification to view with considerable optimism its outlook in as far as basic demand is concerned. Certainly the advancement of educational and sanitation standards will continue. It is known that our population is increasing at somewhat above a normal trend. With apparent shortages existing in practically all items of common use, both in the durable and consumer goods fields, there appears to be little justification for any major depression. Without posing as a prophet, it seems to me that there is an element of common sense, which if applied to the general situation by any one who is reasonably well read with respect to general conditions and conditions within the pulp and paper industry in particular, that justifies a degree of optimism.

Going beyond the domestic picture, it must be borne in mind that with respect to paper, outside of Canada and northern Europe, the whole world is practically on a starvation basis. This demand will in the long run be filled and I am sure that it will have advanced far above pre-war levels.

With regard to papermaking capacity, the record of the industry is clear. There never has existed a latent demand, even a speculative one, that has not inspired the industry to install new capacity to absorb new business even to the point of excesses. While there may be temporary difficulties in ob-

(Continued on page 136)

Writing Paper Group Holds Busy Sessions

NEW YORK—M. D. Bardeen, president of Lee Paper Company, Vicksburg, Mich., was elected president of the Writing Paper Manufacturers Association at its 86th Annual Meeting held at the Waldorf-Astoria Hotel on Tuesday. Mr. Bardeen replaces as president, H. H. Hanson, president of W. C. Hamilton & Sons, Miquon, Pa. M. C. Dobrow was re-elected executive secretary-treasurer.

Others elected were: H. V. Burgee, vice-president and chairman of the Rag Content Group; W. B. Zimmerman, vice-president and chairman of the Sulphite Bond Group.

Members elected to the Association's Executive Committee were: G. H. Gerpheide; A. C. Gilbert; Hale Holden, Jr.; R. S. Madden; D. E. Oberweiser; E. C. Reid; A. J. Schierl and G. E. Williamson, all members of the Rag Content Group Executive Committee and H. R. Baldwin, W. J. Garrity, H. H. Hanson, W. L. Jennings, C. B. Morgan, A. C. Remley, F. H. Savage and R. I. Worrell, members of the Sulphite Bond Group Executive Committee.

In addition, the following also were elected to the Association's Executive Committee: Kendall Wyman, representing the Bristol Board Group; R. H. Morrill, representing the Cover and Text Paper Group and Bruce Crane, representing the Thin Paper Group.

Speakers at the Association's meeting were: Murray Shields, vice-president, the Bank of the Manhattan Company; Harold I. Martin, Labor Relations Consultant of Holyoke, Mass., and H. H. Hanson, retiring president of the Association.

M. C. Dobrow, Executive Secretary of the Association reviewed conditions in the paper industry during 1946 and discussed the 1947 outlook for the fine paper industry.

"In the paper industry itself," Mr. Dobrow said, "the sales outlook was never rosier. All segments are pretty well sold out through the spring of 1947. Nothing yet has appeared on the horizon to indicate any change in this huge demand for paper—the longest sustained demand on record."

Turning to wood pulp, Mr. Dobrow said, "The outlook is still for an extremely tight world pulp market well into 1948. Only a recession in the demand for paper can alter the world's scarcity of pulp."

National Box to Add To Vancouver Box

VANCOUVER, B. C. — National Paper Box Ltd. has placed a contract with the Dominion Construction Company Ltd. for a new plant to be erected at 150 West First Avenue, Vancouver. The new plant will employ about 100 men and 50 women.

Blackstone Studios

HAROLD O. NICHOLS

General Chairman, Sulphite Paper Manufacturers Association, Inc.

Sulphite Group Re-elects Its Slate of Officers

NEW YORK—At the annual meeting of the Sulphite Paper Manufacturers Association, Inc., on Monday of this week the following officers were re-elected: General Chairman, Harold O. Nichols; Vice-Chairman Bleached Group, James G. Conley; Vice-Chairman Unbleached Group, George Stuhr; Vice-Chairman Manila Group, Rufus L. Sisson, Jr., Vice-Chairman Machine Glazed Wrapping Group, Neil E. Nash; Vice-Chairman Bleached Converting Group, Gilford F. Henderson.

The following members of the Board of Governors were also re-elected: Jack B. Cowie, Edgar W. Kiefer, and Rufus I. Worrell.

Two vacancies on the Board were filled by the election of the following: Leo E. Croy, executive vice-president of the Marathon Corporation, and Allan G. Hendry, in charge of waxing paper sales, of the Consolidated Water Power & Paper Company.

The Board of Governors, at its morning meeting, appointed William W. Corlett of Wise, Corlett & Canfield, counsel, and Thomas J. Burke as Secretary-Treasurer.

Champion Elects Rowe to Board

HAMILTON, Ohio — John J. Rowe, Cincinnati, has been elected a director of the Champion Paper and Fibre Company. Mr. Rowe is president of the Fifth Third Union Trust Company of Cincinnati. He holds directorships on the boards of twenty companies, including the Philip Carey Manufacturing Company, Crosley Motors, Inc., Eagle Picher Company, General Machinery Corporation, Globe-Wernicke Company, Procter and Gamble Company, U. S. Printing and Lithographing Company.

Groundwood Makers Warned of Imports

NEW YORK—Groundwood printing paper manufacturers were cautioned against frantic new mill and machine building by Robert E. Canfield, executive vice-president of the Groundwood Paper Manufacturers Association, at the annual meeting of that Association at The Waldorf-Astoria. Citing his belief that the present demand for printing paper is abnormal and distorted, and referring also to the huge increase in imports under the Washington Administration's Reciprocal Trade Agreement program, Mr. Canfield said in part:

"The present market for printing papers is far out of line with past trends. Unless the war has fundamentally changed the reading and buy-habits of 140,000,000 people, which seems unlikely, it would appear that present demand is exaggerated. Manufacturers are advertising at an all-time peak rate; one which seems to me to be impossible or at least impractical of maintenance as a normal thing. Publishers have recently deliberately overprinted in an effort either to determine the saturation point of the market, or to force circulation to maintain guaranties set at high levels.

"The longer and the more demand exceeds supply the more distorted the industry will become and the more likelihood there is of disastrous collapse when the inevitable averaging out starts. If, as I believe likely, the overall per capita demand for printing and other fine papers remains relatively constant in the future, we can expect moderate growth in tonnage due to annual increment in population, which currently is approximately one per cent per year. If groundwood paper is to grow faster than that it will have to be through shifts within the industry. New machines having a total capacity of over a quarter million tons are being built by mills using groundwood pulp. And then we have our Canadian friends. What they are planning to do I do not know in detail, although it is known that groundwood paper capacity is being increased substantially, some, at least, by diversion of capacity now used for the manufacture of newsprint for American newspapers to this more profitable grade. In 1946 they shipped over 80,000 tons of dutiable printing paper into this country, nine times as much as prewar, due to the reduction of duty rates through a Reciprocal Trade Agreement.

"Unless my basic idea, that per capita demand for fine papers is not going to increase radically, is entirely wrong, there is no need for frantic mill and machine building. What there is need for is all the knowledge, all the information, all the good judgment, all the intelligence, and all the tolerance that can possibly be found, in order to assimilate new capacity at home and abroad, and to handle shifts in the industry in an orderly manner.

Paper Production Achieves a New High

Over-All Production in 1946 of 19,157,000 Tons Shows Gain of 10% Over 1945—Prospect for 1947 Indicates Output Approximating 20,000,000 Tons

By M. C. Dobrow, Executive Secretary, Writing Paper Manufacturers Association

The paper industry in the United States made another new record in 1946, exceeding the previous high production mark of 1941.

In the closing months of last year the paper industry achieved unexpected high levels of production — somewhat higher than the records looked for early in 1946. For the year as a whole, 1946 production of paper and paperboard in the United States was 19,157,000 tons. This was a gain of 10% over the 1945 production of 17,371,000 tons; a gain of 42% over the 1939 output of 13,510,000 tons.

Despite these production records, every ton of paper produced was, and continues to be, eagerly sought after at home and abroad.

These new records of production in practically every segment of the industry were not easy of accomplishment because of limitations in equipment, frequent labor shortages, shortages of raw materials and supplies. Perhaps the most outstanding difficulty, particularly in the latter part of 1946, was that of obtaining adequate supplies of woodpulp by paper mills which purchase all or part of their basic raw materials from others.

The paper manufacturer is now asking everyone he meets—will this demand last? The buyer or consumer of paper wants to know—how soon can he get more—will the paper industry be able to produce more paper in 1947?

Installations of new machines and expanded facilities for producing on old machines have been projected by enterprising factors in the industry, as they have been in the past under similar circumstances. Due to war-time delays, reconversion, strikes and other difficulties, completion of expanded facilities has been delayed and, in a few cases, postponed indefinitely. Perhaps the inflationary rise in cost of new facilities has discouraged some of the projects and prevented them from going beyond the blueprint stage. But there are enough indications that there will be ample capacity in 1947 for the production of 20,000,000 tons of paper and paperboard in the United States. And the paper industry hopes that the customers will be willing and able to use this huge amount. As a service industry to business and to other activities in the economic and social lives of our citizens, the paper industry is naturally sensitive to, and always has a weather-eye out for, business conditions in general.

In recent months the United States has been enjoying the most pessimistic boom in its history. Total industrial production has been at the highest peace time level but public sentiment has been predominantly gloomy and there has been much discussion of an expected recession or slump. Various economic forces have been sufficiently unbalanced to warrant the expectation of some kind of moderate adjustment or recession in 1947, but a major reversal is not to be expected unless there should be a kind of knock-down, drag-out fight between industry and labor. However, dangers of a large scale stoppage of production apparently have been greatly diminished by what has happened in the steel and automobile wage negotiations.

In many quarters it still is feared that the current year will be one of general recession, although there seems to be a sound basis for the opinion that the 1947 readjustment will be selective, industry by industry, with aggregate industrial volume above the 1946 average.

Early in 1947, in the paper industry iself, the sales outlook was never rosier. The industry is pretty well sold out into the Spring of 1947 and nothing has appeared on the horizon to indicate any change in this great demand for paper—the longest sustained demand on record.

PULP PROSPECTS FOR 1947:

As far as the over-all pulp picture is concerned, it is probable that pulp supplies will be adequate to meet a production of 20,000,000 tons of paper which has been estimated as the output in 1947.

UNITED STATES CAPACITY AND PRODUCTION BY GRADES

Grade	1941 Capacity	1941 Actual Production	1941 %	1944 Capacity	1944 Actual Production	1944 %	1945 Capacity	1945 Actual Production	1945 %	Preliminary 1946 Capacity	Preliminary 1946 Actual Production	Preliminary 1946 %
Writing Paper	750,000	738,434	98	860,000	790,790	92	860,000	813,885	95	920,000	894,600	97
Other Fine Papers	224,800	211,580	94	200,000	176,227	88	210,000	186,909	89	250,000	246,400	99
Book Paper	2,045,000	2,025,891	99	1,800,000	1,443,140	80	1,800,000	1,501,015	83	2,020,000	1,939,400	96
Groundwood Printing and Specialty Papers	660,000	642,676	97	660,000	593,094	90	665,000	636,926	96	810,000	768,400	95
Newsprint Paper	1,080,000	1,043,999	97	900,000	720,752	80	895,000	725,475	81	850,000	778,400	92
Tissue Paper	920,000	912,874	99	1,030,000	965,433	94	1,043,000	980,788	94	1,150,000	1,020,800	89
Wrapping Paper	2,955,000	2,778,441	94	3,100,000	2,559,447	83	3,150,000	2,641,229	84	3,250,000	3,007,300	93
Building Paper	1,175,000	917,912	78	1,100,000	881,246	80	1,109,000	883,259	80	1,160,000	1,014,500	87
All Other Papers	142,000	90,598	64	110,000	90,107	82	110,000	88,643	81	110,000	98,300	89
Total Paper	9,952,000	9,362,405	94	9,760,000	8,220,236	84	9,842,000	8,457,229	86	10,520,000	9,768,100	93
Paperboard	8,750,000	8,399,960	98	9,500,000	8,962,568	94	9,700,000	8,913,736	92	9,900,000	9,389,100	95
Total Paper and Paperboard	18,522,000	17,762,365	96	19,260,000	17,182,804	89	19,542,000	17,370,965	89	20,420,000	19,157,200	94

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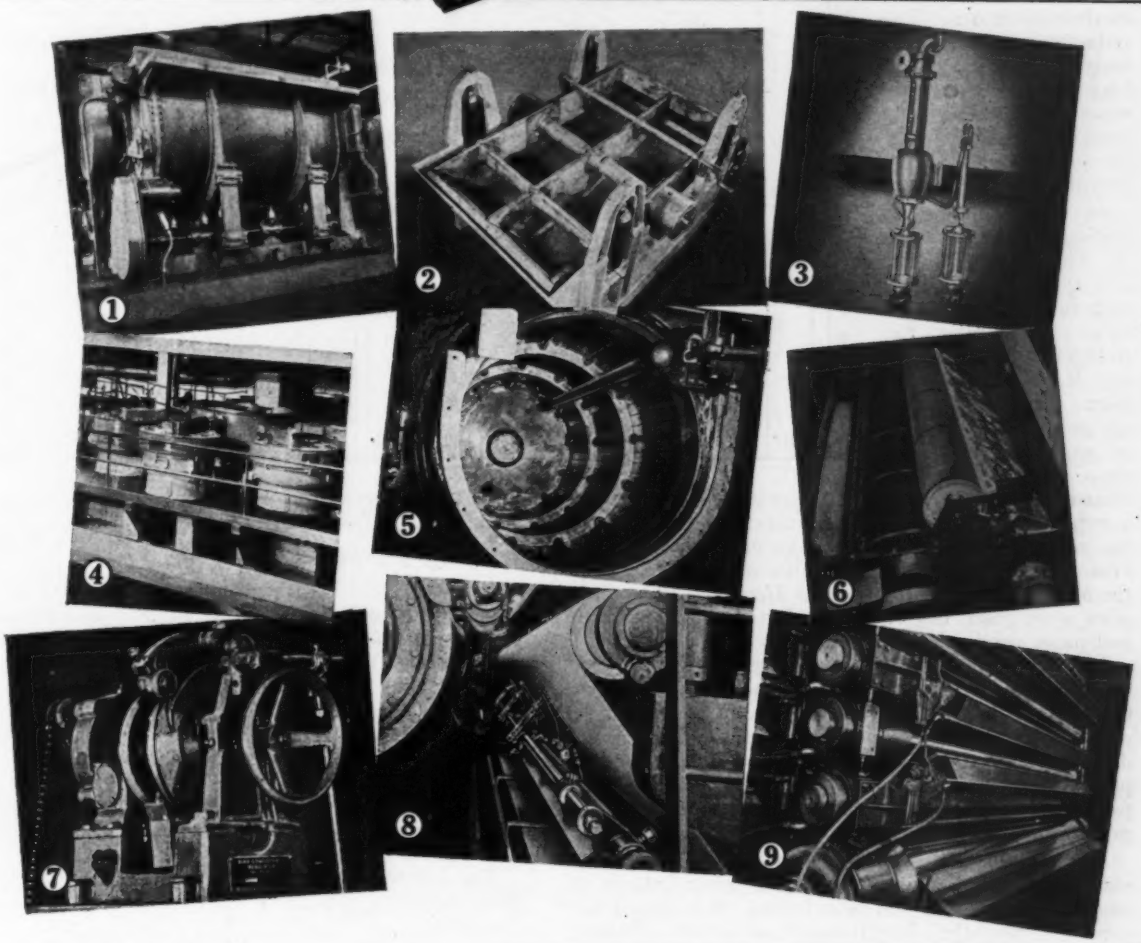
For the Making of Better Pulp and Paper And More of It Per Day At Lower Cost Per Ton



1. **The BIRD SCREEN** — standard of the world for continuous, high speed production of uniformly good paper; handles better than 80% of all the paper made in North America.

2. **The JONSSON SCREEN** — fast proving itself the one best knotter for all kinds of pulp and for brown stock ahead of washers; ideal for screening straw stocks and waste paper stock.

3. **The BIRD DIRTEC** — the most effective means of removing dirt ahead of the paper machine by the low cost pressure-drop principle; ideal for handling screen tailings, too.

4. **The BIRD CENTRIFINER** — produces cleanest paper of fine grades and specialties by triple centrifugal treatment.

5. **The BIRD OSCILLATING SHOWER PIPE** — keeps screen plates clean with minimum shower water. Improves screening efficiency and control of papermaking water.

6. **The BIRD SAVE-ALL** — recovers good papermaking fibres from waste water at lowest net cost per pound.

7. **The BIRD CONSISTENCY REGULATOR** — holds stock consistency to not more than 0.1% heavier or lighter than desired; thoroughly dependable and trouble-free.

8. **The VICKERY FELT CONDITIONER** — for keeping press felts continuously clean and absorbent without midweek shut-downs.

9. **VICKERY DOCTORS** — for keeping all papermaking roll surfaces in shape to do their best work at all times.

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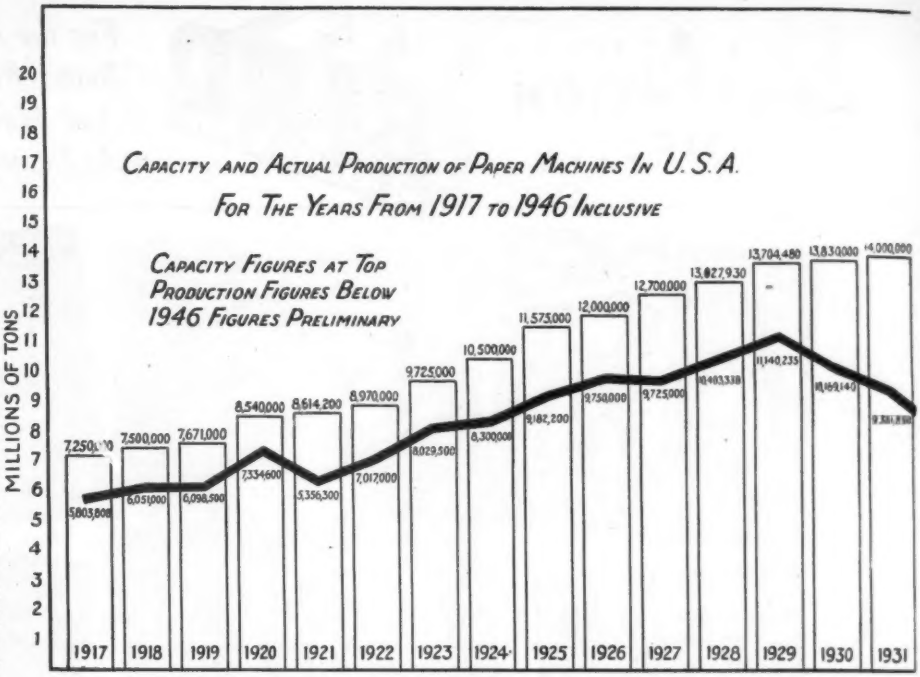
On the other hand, the new supply of *market pulp* for 1947 is not likely to be up to all requirements.

During 1946 mills which purchased pulp lost about 200,000 tons of their inventories. The reduction would have been greater had it not been for the better-than-expected domestic pulp production and increased pulp imports from Canada.

In the beginning of 1945, pulp inventories in the United States were 333,000 tons. This amount was not adequate to maintain full production in the industry. It was only by the most careful rationing of pulp and limitation of paper production by the War Production Board that all mills were kept operating—but many on a reduced basis. With the termination of the war and the receipt of imports from Sweden's stockpiles, inventories rose to 452,000 tons on October 1, 1945. Since the prospects for further receipts from Sweden's stockpiles were good, the WPB lifted its controls on pulp and paper production.



In the beginning of 1946 pulp inventories were 750,000 tons. By the end of 1946 they had declined to 535,000 tons. These inventories are likely to be further reduced in the first 5 months of this year. They will undoubtedly be at levels which are inadequate for full paper mill operations in a free market. Converting paper mills will be squeezed as to supplies, as well as price.

In the latter half of 1947, when arrivals from overseas are resumed, it is hoped that a better balance of market pulp supplies will be achieved. It is hoped that imports from the Scandinavian countries, Finland, Sweden and Norway, will approximate 750,000 tons in 1947—as compared with the 554,000 tons in 1946.

Early last year, following the lifting of pulp restrictions, there was a decided tendency in the white paper field to use less substitute fibers and to increase the use of virgin pulp fibers. As the world-wide shortage of pulp again became evident, the trend was reversed. Consumption of waste paper established a new high record in 1946. Total waste paper used in the paper and paperboard industry in recent years was as follows:

1939	4,366,000 tons
1941	6,075,000 tons
1944	6,859,000 tons
1945	6,800,000 tons
1946	7,296,000 tons

If demand for paper continues at the present level, it is not likely that converting mills will be able to improve their inventory position of pulp by the end of 1947, as compared with the end of 1946.

The outlook is for an extremely tight world pulp market well into 1948, at least. Only a recession in demand for paper in the United States, followed by important reductions in American paper production, can alter the world's scarcity of pulp.

INDUSTRY PERFORMANCE IN 1946:

In 1946 the industry produced 19,157,000 tons of paper and paperboard. For the industry as a whole this was a gain of 8% over the 1941 previous production record of 17,762,000 tons.

The figures for the various segments of the industry should be examined carefully because all branches did not make the same relative gain. Government regulations to meet war time needs altered the pattern of production in the various grades. In 1946, the first full year of unregulated production, there was a tendency for many grades to get back to something like their prewar pattern.

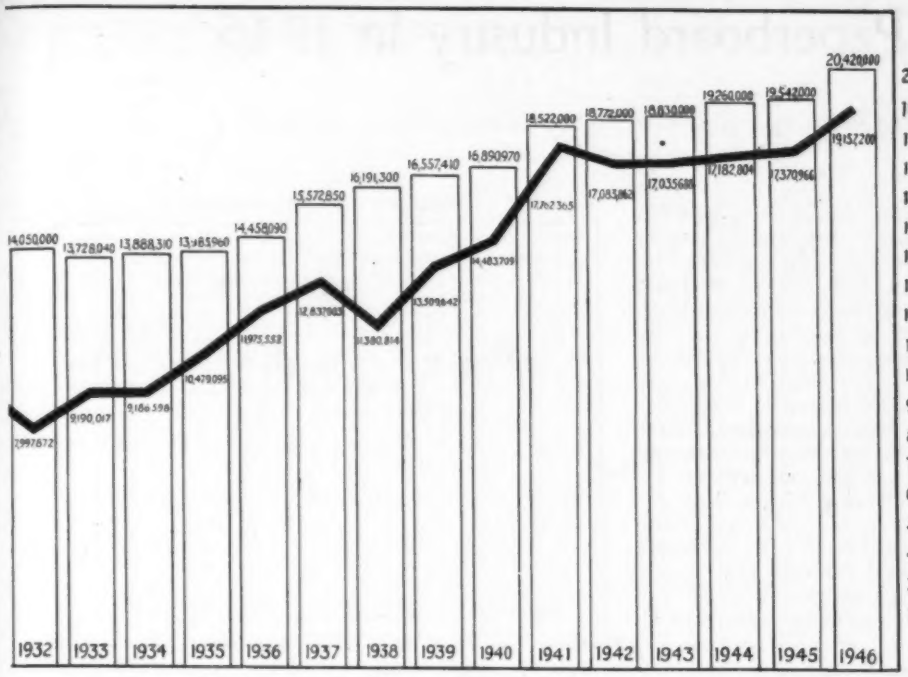
The following changes in production, compared with 1939 and 1945, indicate to some extent the character of the shifts:

	1946 Production as Related to	
	1939	*1945*
Fine	+58%	+14%
Book	+26%	+29%
Groundwood	+42%	+21%
Newsprint	—18%	+ 7%
Tissue	+57%	+ 4%
Wrapping	+34%	+14%
Building	+54%	+15%
All Other	—47%	+11%
TOTAL PAPER	+31%	+16%
Paperboard	+56%	+ 5%
TOTAL PAPER & PAPERBOARD.	+42%	+10%

Paper production is again greater in volume than paperboard production.

Fine paper production at 1,141,000 tons in 1946 was 14% higher than in 1945 and exceeded the previous peak year which was 1942 when the production was 1,043,475 tons.

After the lifting of the severe war time limitations on the use of paper for publication, book paper production in 1946 increased to 1,939,400 tons, a gain of 29% over the 1945 production. This did not quite come



up to the production of 1941 — 2,025,900 tons, the previous peak year. However, in the closing months of 1946, the rate of production of book paper exceeded that of 1941.

EXPANSION OF PAPERMAKING FACILITIES:

Shortly before the war came to an end, considerable improvements to existing equipment and installation of many new machines were planned in the industry. Total additions to existing capacity in the United States are estimated at about 1,000,000 tons for 1946 and 1,500,000 for 1947.

The capacity of the industry in the United States is expected to be approximately 22,000,000 tons at the end of 1947; in 1939 it was 16,500,000 tons.

These expansions were projected at the relatively high costs of 1944-45. Two unexpected things have developed since that time. First, the projects as originally planned were, or are being, delayed in completion anywhere from 12 to 24 months. Second, the owners of these properties find that the cost of completion is considerably higher than the original estimates. Some of the new installations may cost more than 50% over the amounts originally calculated.

LOOKING AHEAD:

During the war years, European paper production generally declined to less than 50% of the 1939 rate. Since then it has been rising—but rising very slowly. It has not matched the consumption requirements of an economy struggling to recover to pre-war levels. Business and social activity could not possibly get along with the volume of paper now produced in Europe. In many grades the gap has been partially bridged with paper purchases from the United States and Canada.

In 1946 the United States produced 59% of the world's paper production, Canada 18%. In other words, 152 million people produced and consumed approximately 77% of the world's supply. Two billion people in the remainder of the world consumed only 23% of the entire world's paper production. As the standards of living in countries other than Canada and the United States improve, paper consumption will increase accordingly. A major share of these increased needs undoubtedly will be supplied by Europe. But North American output will continue to be relied upon for many needs.

The American paper industry appears to be in a position where it may look to the future with optimism, tempered with caution. The demand for its products was definitely increased by the war which stimulated the development of many new uses for paper in the packaging and industrial fields and simultaneously broadened American reader-interest in books, periodicals and newspapers. Consequently, the paper industry, even though enjoying a favorable upward growth curve before the war, is now experiencing a momentum of new demand which is carrying it to unexpectedly high levels.

However, it may not be amiss to point out that existing papermaking capacity plus expected additions will exceed most estimates of 1950-51 requirements. One calculation recently made, based upon the expected growth of population in the United States and the recent rate of growth of per capita consumption, indicates possible requirements (exclusive of imported newsprint) of 21,300,000 tons per year by 1951.

Another problem for the future, at least that immediate future which concerns us now, is to obtain adequate supplies of wood and other fibers to meet the needs of this expanding paper production.

It is one thing to plan new papermaking capacities and quite another to make provision for the raw material fibers that these capacities require for full operation. All of the ingenuity shown by the American papermaker in meeting his difficult problems during the war years will be called upon to cope successfully with these problems of the post-war period.

WOOD PULP, ALL GRADES
SUPPLY—DEMAND

1945

Supply		U. S. Consumption and Exports	
Imports—Canadian	1,079,000	Exports	136,000
Imports—European	675,000	In Manufacture of Non-paper Products	540,000
U. S. Production	10,167,000	In Manufacture of Paper and Paperboard	10,825,000
			11,501,000
		Inventory Replacement	420,000
	11,921,000		11,921,000

1946

Supply		U. S. Consumption and Exports	
Imports—Canadian	1,235,000	Exports	40,000
Imports—European	560,000	In Manufacture of Non-Paper Products	496,000
U. S. Production	10,615,000	In Manufacture of Paper and Paperboard	12,080,000
Withdrawal from Inventory	206,000		
	12,616,000		12,616,000

The Paperboard Industry In 1946

By Grafton Whiting, Statistician, National Paperboard Association

The production of paperboard during the year 1946 was 8,320,000 tons (preliminary) representing a gain over the 7,873,000 tons in 1945 of 5.7% and better by 4% than the previous all-time high reached in 1944. During the early part of the year bad weather and labor shortage curtailed production in the South and the various strikes directly and indirectly have interferred with output. If we assign to these various interruptions the estimated tonnage that would otherwise have been made, the total would have been greater by 150,000 tons. The new high record has been accomplished, not by the addition of new plants to the industry, but by those already in operation. Following release from the 1945 restrictions the mills have been able to install betterments and additions to equipment with the result that output has been increased without any major changes in capacity. A new high volume of production of 175,000 tons of paperboard in a single week occurred in November 1946.

Orders

The bank of unfilled orders the first of January 1946 stood at 526,900 tons or 19.6 days to run. At the first of January 1947 the orders were 588,400 tons or 20.3 days. Following a gradual improvement in the second and third quarters of the year, the fourth quarter registered a slight decline.

In pre-war times a bank of unfilled orders representing 8 days to run was considered a favorable position. Now with over 20 days the mills, as a rule, have delayed the acceptance of orders that would call for delivery beyond the present averages. This causes an understatement of the true demand. On the other hand, a buyer of board, recognizing the present condition, may place orders with two or more mills for the same requirement, thus overstating his actual needs. It will take time before this situation is altered. The gap between demand and supply will have to be substantially narrowed either by a dropping off in orders — which now seems unlikely to be soon — or the entering of the new capacity, which is, as yet, in the building stage.

The average weekly orders, production, unfilled orders and days to run for each quarter year, are as follows:

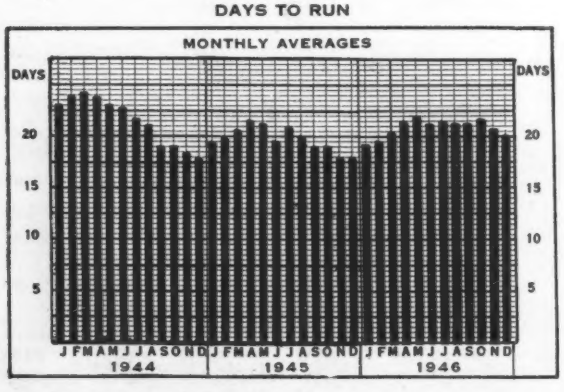


CHART I—The bank of unfilled orders is expressed as the number of days to run necessary to complete all outstanding orders based upon full operation for a 24 hour period. The days are here shown as a monthly average.

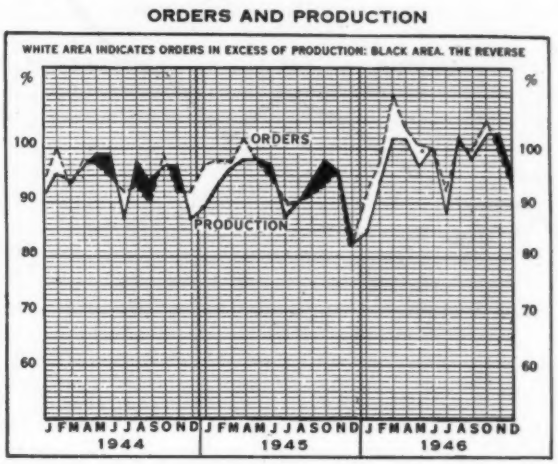

ORDERS AND PRODUCTION
WHITE AREA INDICATES ORDERS IN EXCESS OF PRODUCTION: BLACK AREA, THE REVERSE
%
100
90
80
70
60
ORDERS
PRODUCTION
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1944
1945
1946

CHART II—Incoming orders and production made in their fulfillment are reduced to a percentage, with 100% equal to 6 days of full operation. Over a given period when unfilled orders reached the level at which the movement started the white area-excess of orders is offset by the black area-excess of production.

Orders and Production

Quarters		*Received Tons*	*Produced Tons*	*Unfilled Tons*	*Days to Run*
1944	1st	149,600	149,500	621,800	23.8
	2nd	151,400	156,900	597,900	22.9
	3rd	146,900	151,100	555,300	20.7
	4th	151,400	152,000	495,300	18.5
1945	1st	159,100	152,100	543,300	20.0
	2nd	156,300	158,600	559,700	20.9
	3rd	150,000	146,000	530,600	19.8
	4th	148,500	149,000	486,000	18.2
1946	1st	162,400	151,600	525,700	19.6
	2nd	164,200	161,200	578,500	21.4
	3rd	162,100	159,800	591,700	21.5
	4th	157,900	167,500	578,300	20.9

The orders received and the amount produced this year show a marked increase over the like period in 1945. The bank of unfilled orders and days to run likewise have advanced.

Chart No. I is drawn to show the days to run as monthly averages for the years 1944 through 1946.

Production

Although production in 1946 exceeds any previous year, there are many hardship cases where converters have been unable to obtain the tonnage of paperboard they require. Some of this dislocation was the direct result of the inequitable assignment of OPA ceiling prices. It is natural that a mill would fill orders that were the most profitable and users of low profit items consequently suffer. An example of the maladjustment is the fact that set-up boxboard was in short supply. The mills scrutinized their orders to give preference to those that were the most profitable, not upon a com-

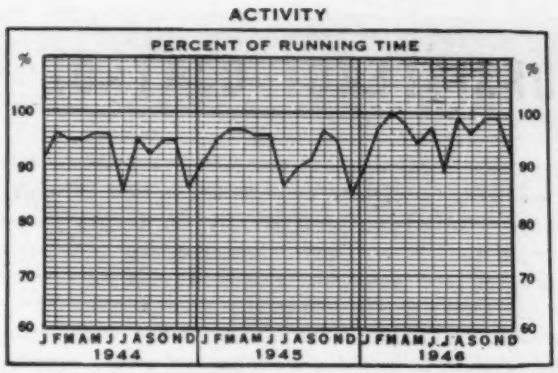


CHART III—Actual operating hours each week divided by 144 hours (6 day week) gives the percent of activity here consolidated into monthly periods. The chart line follows in general the production line on Chart No. II.

petitive demand and supply basis, but upon government dictated ceilings. As a result there was an unnatural flow of board which changed direction whenever price ceilings were altered.

Following the end of price controls, readjustment took place gradually and the unnatural flow was replaced by a return to trading based upon the demand and supply.

Chart No. II contrasts the orders received and the production made by months during 1944 through 1946. This is built up from the same set of figures shown in the table of Orders and Production but for the purpose of the chart monthly totals of each series are expressed as a percentage with 100% equal to 6 days of full operation.

Eleven paperboard mills were purchased by converters during the year to insure an adequate supply of board and six converting plants were taken over by paperboard mills in the demand and supply predicament.

While this realignment has benefited those involved, it has deprived others of a source of supply they had formerly counted upon. The demand for gypsum board to further the housing program was another drain upon the supply of board which otherwise would flow to paperboard fabricators.

There are 11 new machines in various stages of construction designed to increase the capacity for making paperboard. Five of these with an estimated weekly output of 10,000 tons are in the Kraft group and 6 with an estimate of 4,500 tons are for Jute. This is an indication of the industry's answer to what may be expected of paperboard in the future.

An analysis of production by grades comparing 1946 with 1945 shows that containerboards are 5% ahead and would have advanced further but for the falling off in the filler chip division which resulted from the sharp decline from the war time volume of solid fibre containers. Reports from the Fibre Box Association based upon the square foot output show a gain this year of 20% over 1945. Boxboard output is 6% above the year before with folding board up 18% to a new high but with set-up and all other grades averaging 4% below.

The average weekly output during the 5 pre-war years was 108,000 tons, during the war years, 155,600 tons and, based on the preliminary total, 1946 was at the rate of 160,000 tons. Verification of the 1946 total cannot be had until the completion of the year's census.

An analysis of production by grades stated in average weekly tons quarterly for 1944, 1945 and 1946 is as follows:

Production — Average Weekly Tons

Quarters	*Container*	*Folding*	*Set-up*	*All Other*	*Total*
1944 1st	76,400	33,200	10,200	29,700	149,500
2nd	82,100	34,800	11,100	28,900	156,900
3rd	80,400	33,800	10,200	26,700	151,100
4th	78,500	35,400	10,300	27,800	152,000
1945 1st	78,500	34,800	9,300	29,500	152,100
2nd	82,600	35,600	10,000	30,400	158,600
3rd	76,200	34,600	9,700	25,500	146,000
4th	76,300	38,700	10,300	23,700	149,000
1946 1st	75,400	41,900	9,600	24,700	151,600
2nd	83,400	42,900	8,900	26,000	161,200
3rd	82,800	42,100	8,000	26,900	159,800
4th	88,200	42,800	9,200	27,300	167,500

If the above table is expressed in percentages that each division is of the total and comparison made with pre-war figures the following is found:

Percentage Comparison

Period	*Container*	*Folding*	*Set-Up*	*All Other*	*Total*
Pre-war	50.7	22.8	10.2	16.3	100
War Years	52.0	22.6	6.7	18.7	100
Year 1946	51.5	26.5	5.6	16.4	100

Container grades are again approaching the peacetime ratio after the heavy war demand. Folding box requirements have far exceeded previous records and have gained at the expense of the set-up box division. All other grades, in which ammunition board was a prominent item during the war, are again at the peacetime level. Since 1% represents some 80,000 tons on a yearly basis, the significance of the changes can be seen.

Activity

Another index of operation of the paperboard mills is the activity or hours the plant is in production. By accumulating the time the machines are actually being used and contrasting this with the possible hours in a six day week (6×24=144 hours) a percentage of activity is found.

Chart No. III is drawn to show the variation in these percentages by months for 1944 through 1946. The

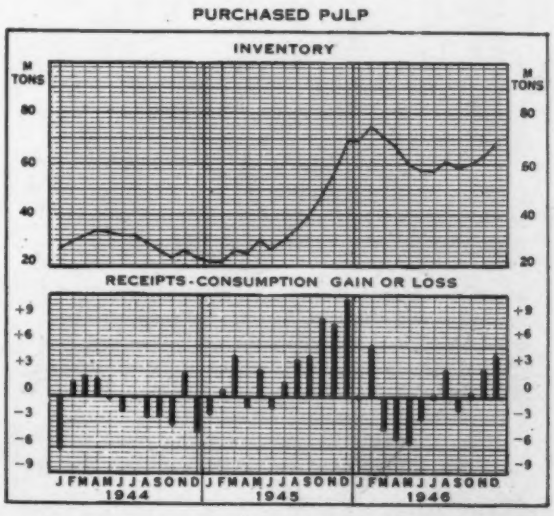


CHART IV—Inventories of purchased pulp reported by identical paperboard mills are shown in tons at the month end in the upper section of the chart. The lower division indicates the gains or losses incurred. The scale of this section is enlarged to accommodate small items.

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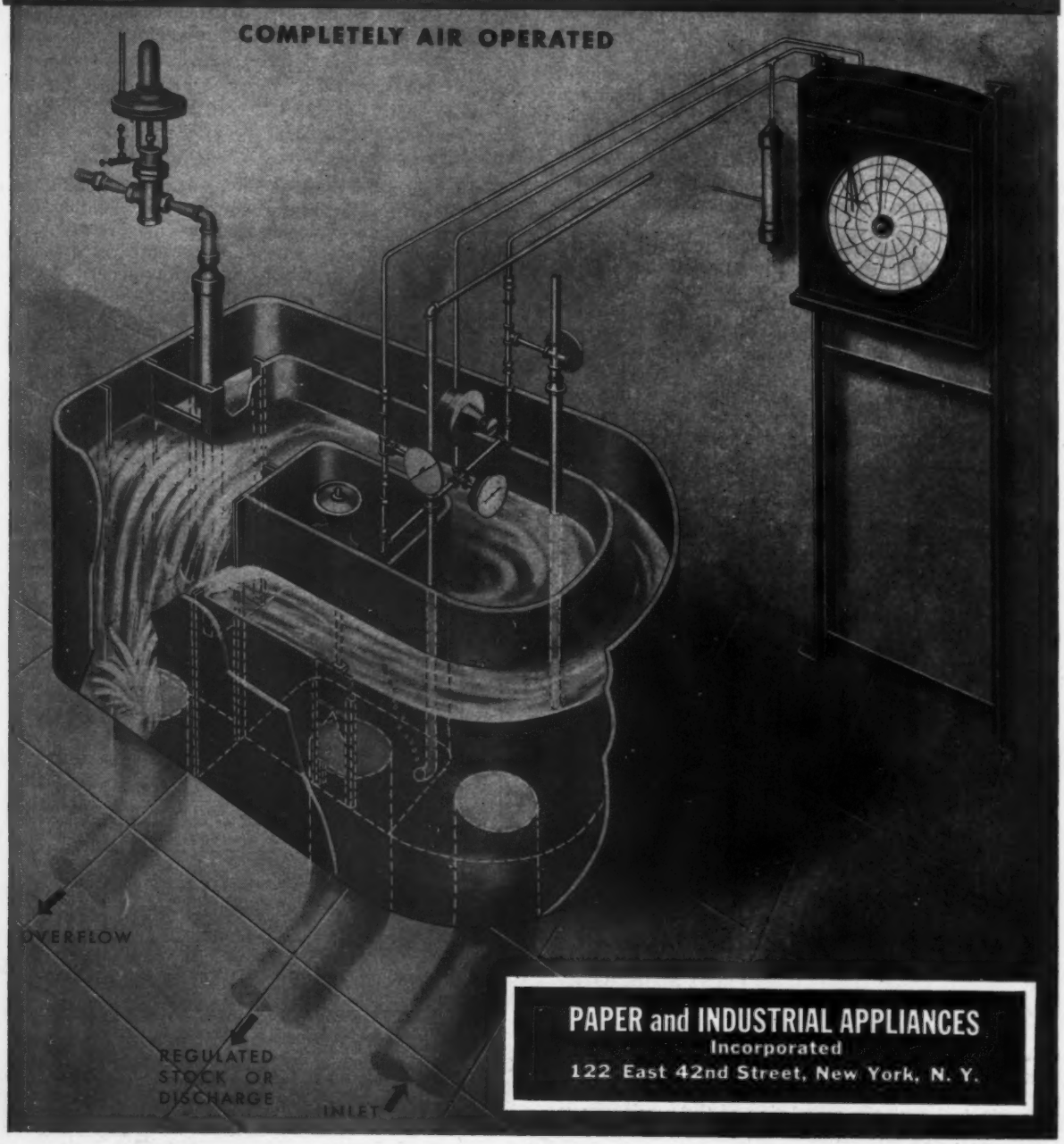

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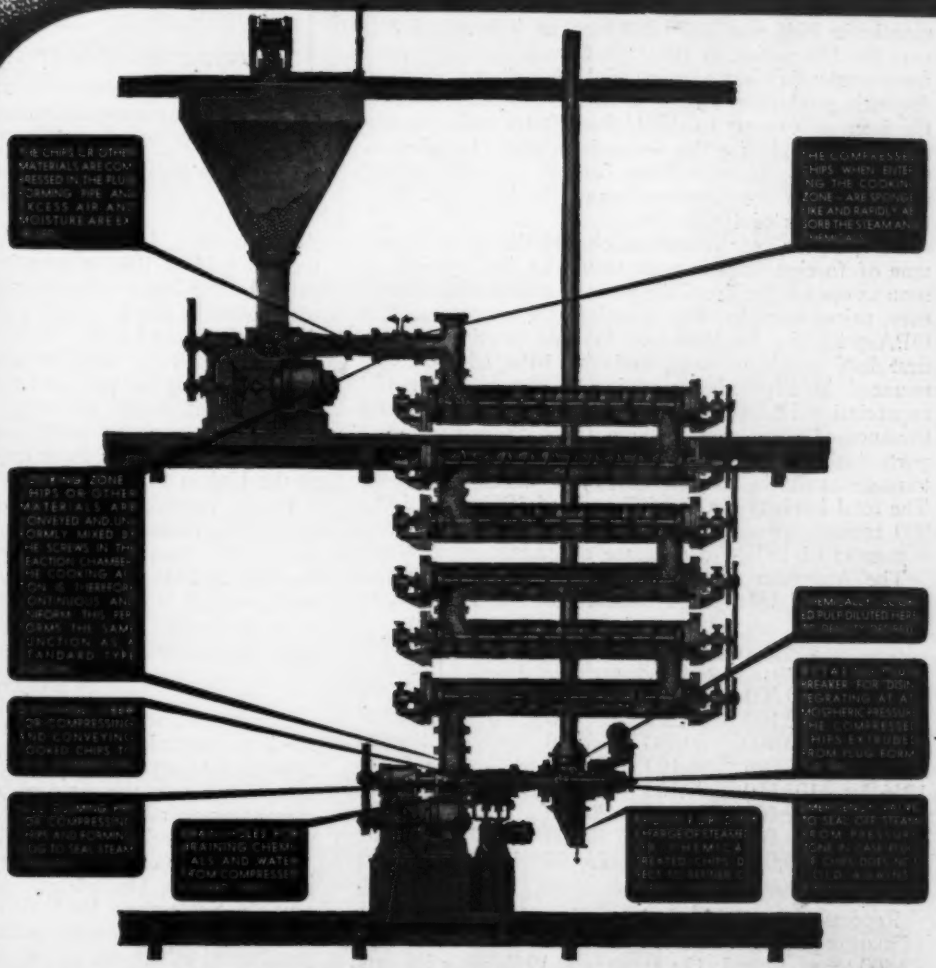

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cumulative activity in 1946 was 96% compared with 93% for both 1944 and 1945.

The average activity has been 92% compared with 74% in the preceding 5 years. The level of the running time in 1946 was more irregular than in 1944 or 1945. This was due largely to the bad weather in the South during the first quarter of the year and the various labor strikes during the second quarter. Nevertheless, the 100%, or 6 days level, was reached 18 times — a record that has not occurred previously in a single year.

In pre-war days activity tended to vary with the volume of incoming orders. Thus it revealed the seasonal trends upward in the Spring and Fall and downward in the Summer and over the year end. No such movement is now discernible with the present excess of orders, but the reasons for seasonal demand have not changed. The need for packaging material is strongest in the pre-holiday season and again in the late winter months when preparation for the Spring trade is made. When the gap between demand and supply is closed seasonal trends will again exert their influences, as in the past.

Woodpulp

The production of pulp in the United States for 11 months in 1946 was 9,879,200 tons, an increase of 3% over the like period in 1945. In Canada 5,893,000 tons were made showing a gain of 17%. About 13% of domestic production and 19% of the Canadian total in the form of exports to the United States make up the American supply for the domestic market. In addition to this are the imports from foreign countries which added 27% to the American supply in 1945 and 23% for 11 months of 1946.

Early in the year it was anticipated that a large volume of foreign pulp imports would be forthcoming as soon as open water freed the ports of debarkation. However, prices were too low to satisfy the exporters. The OPA price rise in April was too late to stimulate the first half year's tonnage, and the 10% advance announced in September was insufficient to offset the appreciation in Sweden's monetary value. The discontinuance of price controls here failed to augment imports during the last part of the year since much of the tonnage available had already been placed elsewhere. The total imports for the full year of 1946 were 543,900 tons compared with 672,300 tons during the last 6 months of 1945 — a decrease of 23.5%.

The American supply and foreign imports for the market stated in average monthly tons is as follows:

Market Pulp

Quarters	*Domestic Mills*	*Canada Imports*	*Swedish Imports*	*Finland Imports*	*Total*
1945 1st	130,300	84,900	0	0	215,200
2nd	132,100	85,200	0	0	217,300
3rd	113,400	89,900	63,500	0	266,800
4th	108,700	96,100	160,600	0	365,400
1946 1st	103,100	99,100	59,200	5,400	266,800
2nd	112,200	104,800	20,500	6,300	243,800
3rd	104,500	98,800	50,300	12,100	265,700
4th*	109,900	115,500	23,100	10,600	259,100

* *October and November average only.*

Reports from 48 identical paperboard mill purchasers of market pulp show that on January 1, 1945, there were 22,400 tons on hand. On January 1, 1946, after imports of foreign pulp had been coming in during the previous 6 months, there were 68,700 tons in inventory. January 1, 1947, shows 68,400 tons, which indicates that the receipts and consumption were substantially in balance. Chart No. IV is a comparison of the inventory and the gain or loss between receipts and consumption. The

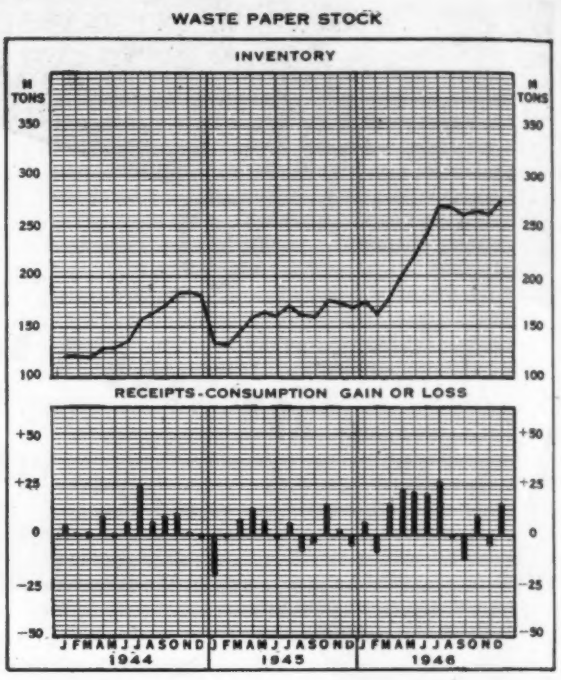

CHART V — Inventories of wastepaper reported by identical companies are shown in tons at the month end in the upper section of the chart. The lower division indicates the gains or losses incurred. The scale of this section is enlarged to accommodate small items.

sharp increase following foreign pulp receipts during the last half of 1945 is seen in the 5 months of heavy gains in the lower chart section. 1946 was irregular with losses in the first half year compensated by gains during the second half.

The outlook for 1947 is not encouraging. There is a world shortage of pulp and the Scandinavian countries are the chief source of supply. At present shipments are held up awaiting open water in the foreign ports and the proportion of these exports which will be made to the United States is still in doubt.

In the meantime some domestic mills are resorting to the use of waste papers as a substitute for virgin pulp where possible just as they did during the pulp shortage in 1944 and 1945. The ability to purchase pulp in the market is essential to permit non-integrated mills to maintain full production. Imports of foreign pulp must be continued if curtailment is to be avoided.

Wastepaper

Receipts of waste paper, reported by identical consuming companies, both East and West, during 1946, expressed as an average week were 80,000 tons. Consumption during the same period was 77,600 tons, thus permitting an addition of 2,400 tons to inventories for the average week. Opening with 170,200 tons on hand January 1, the closing inventory was 274,100 tons, or a gain of 61%. The all-time record high was 356,100 tons, in September, 1942. Unfortunately, the stock is unevenly held with some mills with only 3 or 4 days supply and others with 30 days and over.

Chart No. V illustrates the inventory held and the gains or losses between receipts and consumption each month during 1944 and through 1946.

A statement of the tonnage received, consumed and ending, and inventory on hand expressed in quarterly averages is as follows:

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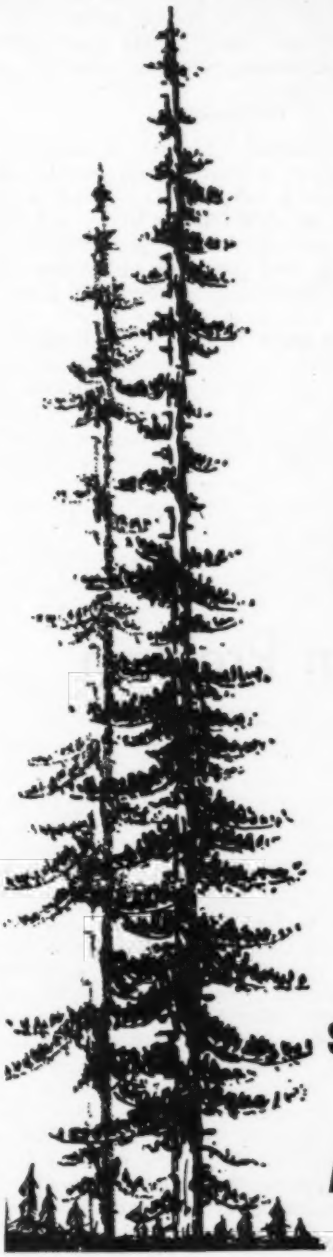

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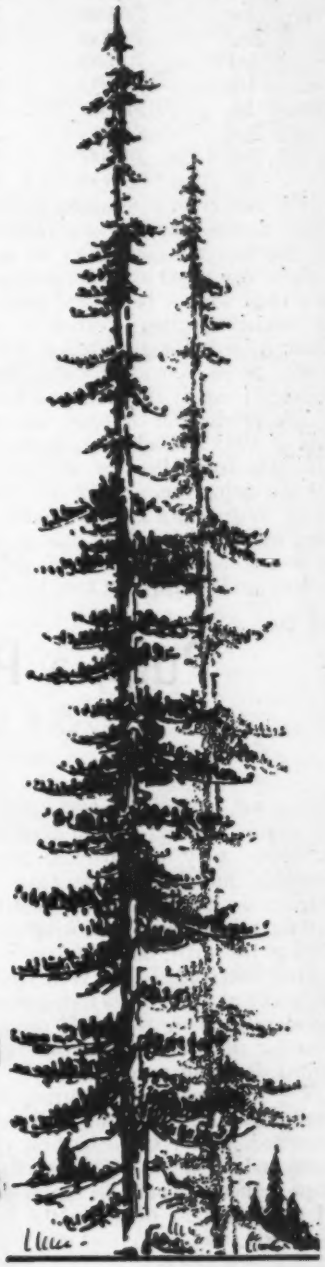

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Waste Paper Stock
Average Weekly Tons, Closing Inventory

Quarters		Received	Consumed	On Hand Ending
1944	1st	73,100	72,700	96,100
	2nd	76,300	75,100	110,700
	3rd	74,600	71,200	149,000
	4th	74,200	73,200	159,000
1945	1st	74,500	75,300	147,700
	2nd	79,000	77,900	163,400
	3rd	70,300	70,500	159,900
	4th	73,500	72,500	170,200
1946	1st	77,200	76,300	180,400
	2nd	81,300	76,400	242,200
	3rd	78,000	76,100	255,100
	4th	83,600	81,800	274,100

The collection campaigns undertaken in the East and West, fortified by past experience, have placed emphasis on the fact that collectors of wastepaper can make a satisfactory profit by picking up a material that is worthless until sorted, baled and shipped to the mill, where the reclaimed fibers become a valuable raw material. Once it is demonstrated that there is good profit to be made, there should result a better and more stable source of supply that can be counted upon in the future.

The production of paper ran more than 15% above that of 1945 and added a similar increase in the amount available for collection and re-use. The consumption of newsprint was greater by 25% with the result that more waste news was obtainable. Paperboard production was 5.7% greater than in 1945. All this adds up to a substantial increase in the amount available for collection and furthermore less paper and paperboard products are being lost for retention through exports. Receipts of wastepaper by the paperboard mills showed an increase of 7.5% over 1945 which was directly attributable to the larger amount available and the efforts of the collection campaigns since prices held much the same during both periods.

In 1945 the paperboard mills used 80% of the total wastepaper consumed in the United States. The paper mills used about 15% and the roofing mills about 5%. Although the paper and roofing mills have increased somewhat their requirements, collections should be sufficient for all users.

Outlook

The paperboard industry, although attaining a new high volume of output, is unable at present to satisfy the growing demand. It has been faced with a strong upward trend in general business with manufacturers increasing the volume of their output. The lack of adequate capacity to meet this demand has been foreseen by the mills. They have known right along that the average yearly growth of the industry is between 3 and 5% and that the normal increase in population in itself alone means a greater consumption of paperboard. Nevertheless, during the past 4 years no major capacity increase has been possible due to the inability to procure new machines. Now the acquisition of machines and the building of new mills long delayed is being hurried forward to provide the needed increase in output. In the meantime the difficulty in distributing the inadequate volume to the satisfaction of either the mill or the user still persists and will continue until the gap between supply and demand is narrowed.

Pulp, a Price and Production Problem

By O. F. Swanson, General Manager, J. Anderson & Company, and Vice-President Pulp & Paper Trading Company

The year 1946, which opened with glowing promise of vastly improved conditions in wood pulp, served to prove very conclusively that whenever optimism abounds, anticipations are apt to soar to unrealistic heights. In a nutshell, that describes the sentiment prevailing in the pulp producing and consuming industry during the early days of last year, but when the optimists received a jolt from the OPA by its refusal to grant a ten- to fifteen-percent price advance for wood pulp, their cherished optimistic views were torn asunder and the little air castles of the optimitsts were pulled down all around them.

The trend of matters during the early months of the year puzzled those within the industry, because, it was reasoned, wasn't 1946 the first year of peace in a long time, and wasn't it to be logically expected that marked improvements would be witnessed, especially in view of the eagerness of all in the industry to bring about a speedy return to the good old American methods of doing business?

Notwithstanding the many and important developments later in the year, 1946 closed with difficulties still existing, and it would require a Rudyard Kipling or Bernard Shaw to appraise properly the numerous and acute problems with which the pulp industry was confronted during the year. It would appear that any business situation could be easily dealt with in retrospect, but this cannot be applied to events in the wood pulp industry last year. In order to gain a fairly accurate idea of what took place so as to present a picture of the situation understandable to all, the whole sequence of events must be submitted to the keenest detailed scrutiny, and even then the viewpoint reached by those endeavoring to analyze the causes for the continued scarcity of wood pulp would doubtless differ in many respects.

It is a known fact that the wood pulp industry in Canada and the United States enjoyed a prosperous year, but the European pulp manufacturers tell an entirely different story. Several pulp producing countries in Europe found it necessary to purchase wood pulp instead of having a surplus to sell to consuming markets. Those on the selling side of the industry tried consistently and strenuously for an appreciable period to induce the OPA to authorize higher prices for pulp, but to no avail. Ultimately, due to the pressing demand for sorely-needed pulp, the consumers took up the battle for higher prices, and while the wind was taken out of their sails temporarily, they persisted in their efforts and succeeded in achieving some results in April, but not soon enough, however, to make much difference in the tonnage procurable because the quantities available to them about six months prior to that time had then been disposed of in other markets at more attractive prices.

Nevertheless, it was a step in the right direction, and it was hoped at the time it would eventually bring about desired results. When on November 10, President Truman courageously terminated price control of wood pulp, a feeling of great relief was experienced through-

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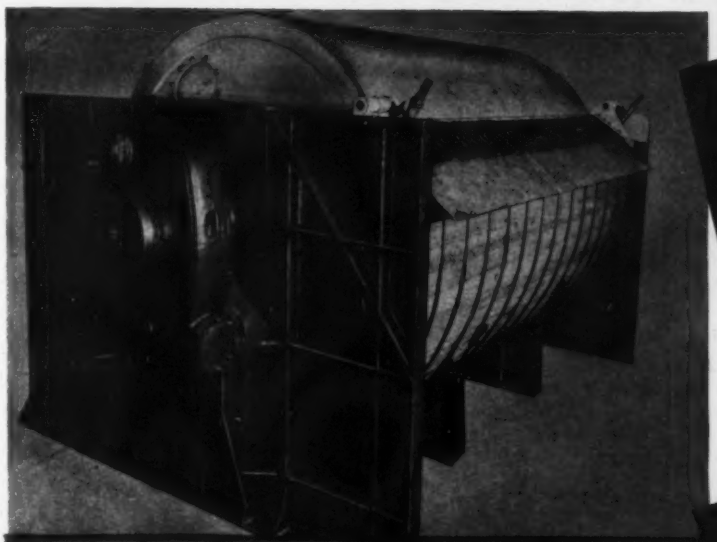

The Oliver Saveall is exceptionally flexible in that it can operate under varying conditions. It provides a choice of three different discharge methods, each best for certain kinds of stock and certain operating conditions. Materials of construction can be selected to prevent any contamination of stock.

Paper mills have ordered hundreds of Oliver Savealls. They were interested in all the "saves" mentioned above and felt that only in the Olivers could they find the best answers to their problems.

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out the industry, and decontrol was followed by some stimulation of trading.

So much has been written in the trade press on the subject of price that it seems unnecessary to treat with this matter further, but it should be stressed that prices are still too low for many former pulp producing countries to entertain business with the United States at prevailing prices except possibly on token shipments. Judging from the almost constant stream of urgent inquiries, consumers are as busy as ever, trying to obtain sufficient pulp to keep their converting paper and board mills running. They have done an excellent job so far, and it is to be hoped they will not let down in their efforts because it seems fairly certain they will have to keep on plugging for at least another year if not longer to enable them to operate on a full production schedule.

Pulp producers and distributors have had no path of roses to tread either, yet taking everything into consideration, those fortunate enough to be on this side of the ocean have had no real reason for complaint, although some may have thought so.

A slight flurry was occasioned by the revaluation of the Canadian dollar to parity with American currency. However, nothing startling occurred, and the situation righted itself in short order. The appreciation of the Swedish krona—about 16 percent—proved to be a harder nut to crack, and is still a thorn in the side of business. This has had a detrimental effect on the price structure in particular and on business in general. Strenuous efforts have been made to iron out this matter and progress is discernible. There seems little doubt the situation will be adjusted to the satisfaction of everyone concerned.

The time may come when peace-loving people throughout the world will be powerful enough to exert their influence on vital issues with a view to creating brotherly love to replace the moth-eaten old policy of "grab all you can," regardless of whether fundamental principles and rules for good will are violated. Force, irrespective of its source and application will never accomplish this, but education devoid of selfish propaganda can do it if given a chance. "Live and let live" must be put into practice on a vastly larger scale than heretofore before noticeable improvement in the behavior of people can be expected. Cooperation in all phases of life, including business, is of vital importance to the general welfare of people at large.

Monopoly, on the other hand, serves its masters with the loyalty of a well-trained watch dog, and woe to anyone not belonging to the combine who seeks to compete in products controlled by a monopoly. Nevertheless, amalgamation of business has been a vogue for several years past, and as the years roll by the number of converting paper and board mills is gradually though steadily diminishing.

Last year did not escape this trend in the wood pulp and allied industries and if the present pace of the absorption of individual small firms by the large and powerful concerns continues, it will not be long before the independent converting mills will be a thing of the past. This evolution in the paper, board and wood pulp industries has led to a tendency to alter the sales policy of some of the large and financially powerful manufacturers since they no longer consider it necessary to utilize independent sales organizations to dispose of their products.

Despite the large production of wood pulp in the United States and Canada last year, and the sizable tonnage supplied by Sweden, Finland and other countries, the available supply of pulp was insufficient to cover the world's requirements, and many consuming mills abroad as well as in the United States were desperately short of pulp. Full advantage of the abundance of wood in Sweden could not be utilized in the manufacture of wood pulp on a pre-war scale because of the severe coal shortage. Wood was used for fuel in both factories and homes, and still is. Although heating homes in Sweden with wood is nothing new, the consumption for the purpose reached an alarming rate during 1946, and seasoned pulp wood ultimately was used for fuel.

Notwithstanding this and other difficulties, it is estimated that Swedish pulp mills operated at about 60 percent of capacity, and approximately 500,000 tons of wood pulp was exported to the United States during 1946. Finland, also contributed about 125,000 tons, making a combined total tonnage of 625,000 tons supplied this country by Sweden and Finland last year. Taking everything into consideration, this can be regarded as a commendable achievement under the circumstances.

No one can predict the tonnage the European countries will be in a position to supply for export this year, which in a large measure will be contingent on the coal situation, the price structure and labor conditions.

At the annual luncheon of the Canadian Pulp & Paper Association in Montreal on January 31, 1947, R. M. Fowler, president of the Association, delivered a most interesting and enlightening address on the developments in the wood pulp and allied industries in Canada over a period of years. He also touched upon the outlook for the future in a modest way, and his reluctance to make definite predictions was well taken by his audience.

However, he painted a rather optimistic picture for the Canadian paper and pulp industries, yet frankly stated that he preferred for his listeners to draw their own conclusions. Some years ago, he said, a former president of the Association predicted a most satisfactory and prosperous year for the industry but it turned out to be one of the worst. As a matter of fact, it was so bad that he felt prompted to apologize to his friends for his mistaken view at the next annual Association meeting. Mr. Fowler evidently learned at that time to confine himself to facts only.

The wisdom and carefulness displayed in business by our good northern neighbors reflects the character of the individuals in the pulp and paper industry in Canada from which we on this side of the border could adopt a few pointers to advantage. Last year Canada generously supplied the United States with about 1,250,000 tons of excellent wood pulp, or a larger quantity than in any previous year. Yet the Canadians could have obtained substantially higher prices in other world markets. Year after year, Canada is playing an increasingly important role in the wood pulp and paper markets of the world. The consistent progress being made by the Canadian industry is a high commendation for those who are directing the industry.

The United States was again to the forefront as the leading world producer of wood pulp in 1946. Appreciating the urgent necessity of increased production of pulp so as to insure supplies for paper and board manufacturers who experienced perhaps the year of greatest demand for their products, a new high record of pulp output was established in this country during the years with one exception, that of 1942. In achieving this excellent record domestic pulp producers succeeded in keeping their customers surprisingly well supplied under the difficult conditions existing.

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Review Of Kraft Paper Industry For 1946

George Stuhr, President Kraft Paper Association, Inc.

The Kraft paper manufacturing industry has just completed the largest year in respect to production and sales in its history. Annual production exceeded one and three-quarter million tons for the first time. It bettered the 1945 production by 16% and that of the former record year, 1942, by 8%.

In order to establish this record several obstacles had to be overcome. The first of these was a shortage of the industry's most important raw material — unbleached kraft pulp. Eighty-three percent of the kraft paper manufacturing industry produces its own pulp. During the first quarter of 1946 the integrated paper mills that were located in the south and west suffered serious shortages of pulpwood due to labor and equipment scarcities and the most unsatisfactory weather conditions experienced in years. Their pulp production and consequently their paper production was sharply curtailed until April. Fortunately, during that same period the remainder of the industry which produced paper from purchased pulp was able to operate at capacity due to larger than normal shipments of Scandinavian pulp which were received from the stock piles that had accumulated in Sweden during the war. Other obstacles which were general to American business such as the two coal strikes, the General Motors strike, the two freight embargoes, the railroad strike and various shipping strikes all had their effects, but these effects were for the most part indirect. Only one company within the industry had a serious strike of its own; that one lasted eighty-five days.

The continued existence of OPA for eleven of the twelve months in 1946 was an additional obstacle to the achievement of the industry's greatest efficiency. Kraft paper prices had been frozen as long ago as May 1941 and had never been adequately adjusted by OPA to meet the constant increase in costs which had taken place over the subsequent five years. Minor corrections had been made but there remained distortions of such serious proportions that many grades of kraft paper completely disappeared from the markets and such large volume prewar grades as grocers bag paper and the various wrapping paper grades were constantly shrinking in volume.

The termination of price controls in November for paper and paper products was not early enough to permit readjustment within the industry before the end of the year. Consequently, production in the year 1946, although of record size, was unfortunately distorted in many respects; many oldtime customers had to be ignored, while other customers obtained their grades in adequate supply.

In looking forward to what are reasonably foreseeable prospects for the new year, one must give thought to (1) supply of raw materials, (2) labor conditions, (3) demand for product, (4) capacities and (5) price.

As has previously been mentioned, unbleached kraft pulp is the industry's most important raw material. Conditions in respect to this commodity differ considerably from what they were a year ago. While slush pulp is now flowing in good supply from the digesters of the integrated mills, the estimated shipments of Scandinavian pulp this year are below those of 1946. These reduced imports are due to the using up of the Swedish stock piles, a slight decline in current Swedish production of unbleached pulp and competition from other parts of the world for this available supply of Scandinavian pulp. Consequently, the non-integrated mills are faced with a serious pulp problem.

There are also clouds threatening the pulp prospect for the self-contained mill. Here the problem is related to the supply of such chemicals as sodium sulphate (salt cake), soda ash and caustic soda, all of which are essential to the kraft process. Many mills are currently operating on a hand to mouth program in their consumption of these chemicals. The 1947 supply picture for these chemicals has, if anything, become darker.

Thus, both the integrated and non-integrated mills are faced with a pulp problem. Inability to solve this problem could easily result in a serious reduction in kraft paper tonnage this year. Its solution through paying whatever is demanded in the import market for pulp or paying spot prices for chemicals wherever obtainable may prove so costly as to be suicidal.

The supply of labor has improved steadily since the war ended. The industry's labor relations appear healthy and no serious difficulties are expected during the current year.

There has been no apparent let up in the heavy demand for kraft papers that existed throughout the war. This had been true in respect to all grades of kraft paper, with almost every customer anxious to obtain quantities of paper in excess of his allotment. The industry's order file does not fully reveal this condition since mills will accept orders only on a month to month basis and limit them to their own machine capacities.

Members of the industry have, of course, been conscious of the forebodings of some of the nation's economists. As manufacturers, they wonder what would happen to kraft paper demand should a real business depression occur suddenly. It is my belief that there are such large shortages to be made up in wrapping paper, in variety and grocers bag paper and in envelope paper, to name a few, that even a depression would not cancel out these needs. Consequently, I cannot see 1947 as the year in which demand will fall below supply.

There have been a great many rumors of increased capacities and new mills in the paper industry. Actually, these new capacities, insofar as the kraft division is concerned, will not be numerous or large. As a matter of fact, today's capacity is lower than it was four years ago due to the conversion of some kraft paper mills to the production of

George Stuhr

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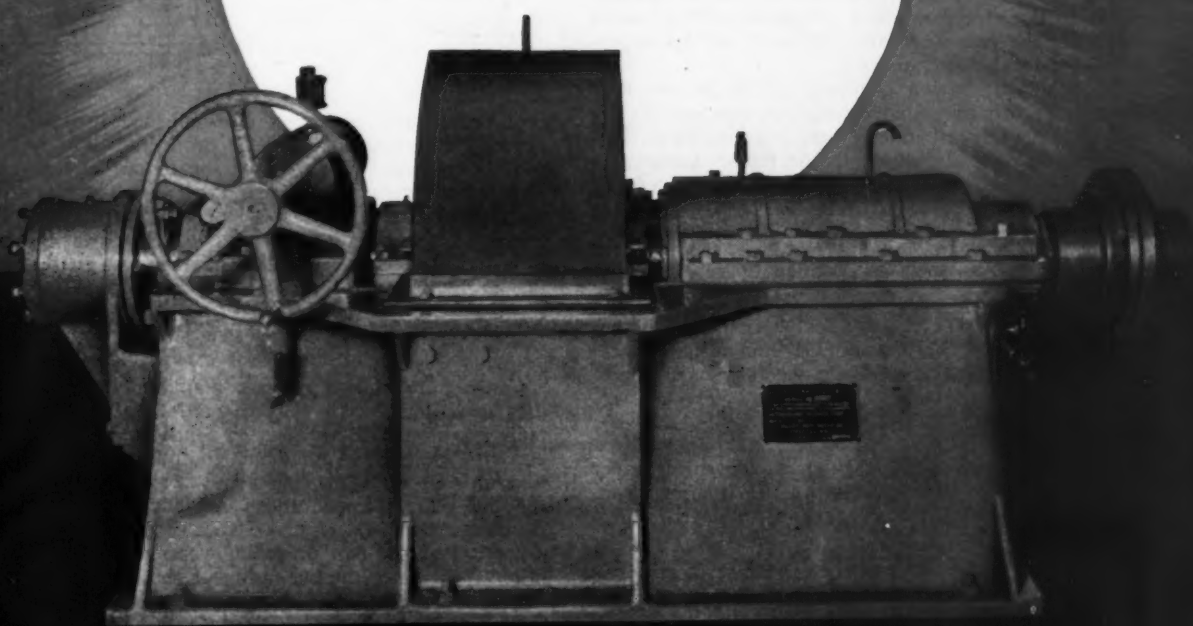

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kraft board. The new machines to be brought into operation during 1947 are being so delayed by construction difficulties that it is estimated that they will add only 4% to this year's production.

Prices in the industry have recently been strong. This is a normal result of the present excess of demand over supply and also of OPA's too rigid policy in respect to pulp and paper during the past five years. When OPA collapsed in November, kraft paper prices advanced almost immediately by about a half-cent a pound, an amount recognized as necessary even by OPA as it released all controls. There have been one or two similar waves of increases that have occurred since as a result of pulp, freight, coal, labor and other cost increases. Except for price readjustments now as between grades, the prices for Kraft paper during the remainder of the year should follow the trend of industrial commodity prices generally and not an independent path

In summarizing these forecasts within forecasts, it would be my guess that despite the serious pulp problem facing both the integrated and non-integrated mills in this industry, the manufacturers will produce approximately 1,900,000 tons of unbleached kraft paper, a new record, during 1947.

Newsprint Paper in 1946

By G. A. Ware, Assistant Secretary,
News Print Service Bureau

The year 1946 was the first since 1939 in which the world at large was not engulfed in warfare. For industry, however, particularly in the United States, the year was far from being a peaceful one.

The U. S. Labor Department reports that in the year just ended, while there were somewhat fewer strikes than in 1945, 1944 or 1937, more workers were involved than ever before and the resultant time lost was very much in excess of any year on record.

Indexes of activity in many lines of business and industry are now at new peace-time high levels but due largely to the aforementioned disturbances, the overall results for the year were in many cases not up to previous hopes and expectations.

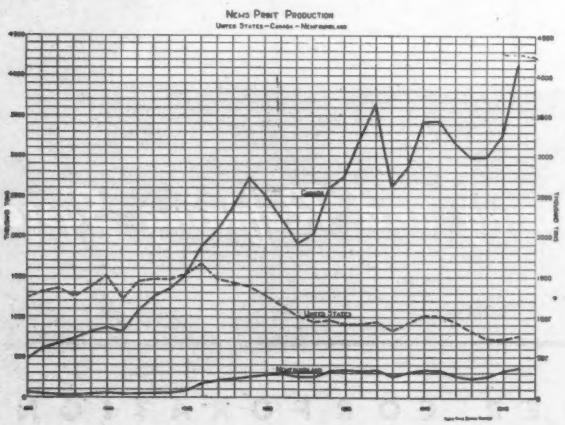
The past year saw a continuation of the excellent long-time record of employer-employe relations in the paper and paperboard industry on this continent. This condition undoubtedly was a major factor in the production of a record tonnage somewhat in excess of 24,000,000 tons of paper and board.

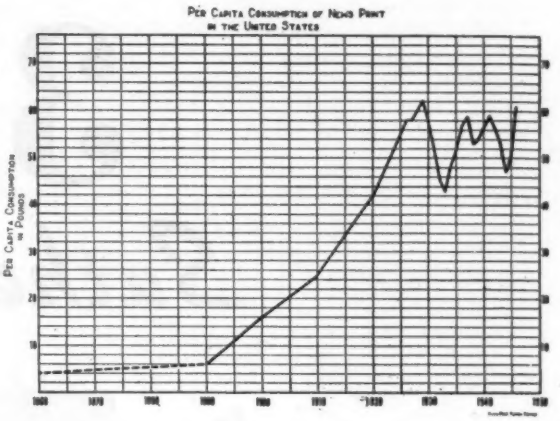
Production of newsprint paper in North America in 1946 was substantially greater than in 1945, but although the highest in any year on record, was not sufficient to meet the apparently insatiable demand. A more detailed discussion of the newsprint statistics follows and the tables and charts appended summarize the results and are helpful in studying the long-time trends.

Supply

Production

In round numbers 5,277,000 tons of newsprint paper were produced in 1946 on the North American continent. This exceeded by 333,000 tons or nearly 7 per-





cent the former high record established in 1937. In making comparisons with 1937 production it is well to remember that a large part of the output in that year went into consumers' stocks. Last year there was no such accumulation of stocks since newsprint was used as fast as it was made. Production in 1946 was 961,000 tons or 22 percent greater than in 1945 and represented the largest tonnage increase recorded in any two consecutive years. In ten of the twelve months, production was higher than in any similar months. Only June and September failed to exceed the earlier records.

Canadian newsprint production amounted to 4,143,000 tons or 78½ percent of the total, the United States mills produced 771,000 tons or a little more than 14½ percent; while Newfoundland's output totaled 363,000 tons or 7 percent. Canadian and Newfoundland totals for the year exceeded those for any similar twelve-month period while United States production, with the exception of the two preceding years, was lower than in any year since the beginning of the century.

The gain in Canadian production last year over 1945 amounted to 884,000 tons or 27 percent; the increase in the United States was 46,000 tons or nearly 6½ percent, while Newfoundland's output exceeded that of the previous year by 30,000 tons or 9 percent. The quantity of newsprint paper produced on Canadian machines last year was 495,000 tons greater than the previous high record of 1937. Newfoundland mills turned out 12,000 tons more than in 1940 which was their best previous year. On the other hand, production in the United States was 913,000 tons below the peak year of 1926.

Shipments from North American mills in 1946 amounted to 5,258,000 tons and were 980,000 tons above 1945. They were, however, 19,000 tons below produc-

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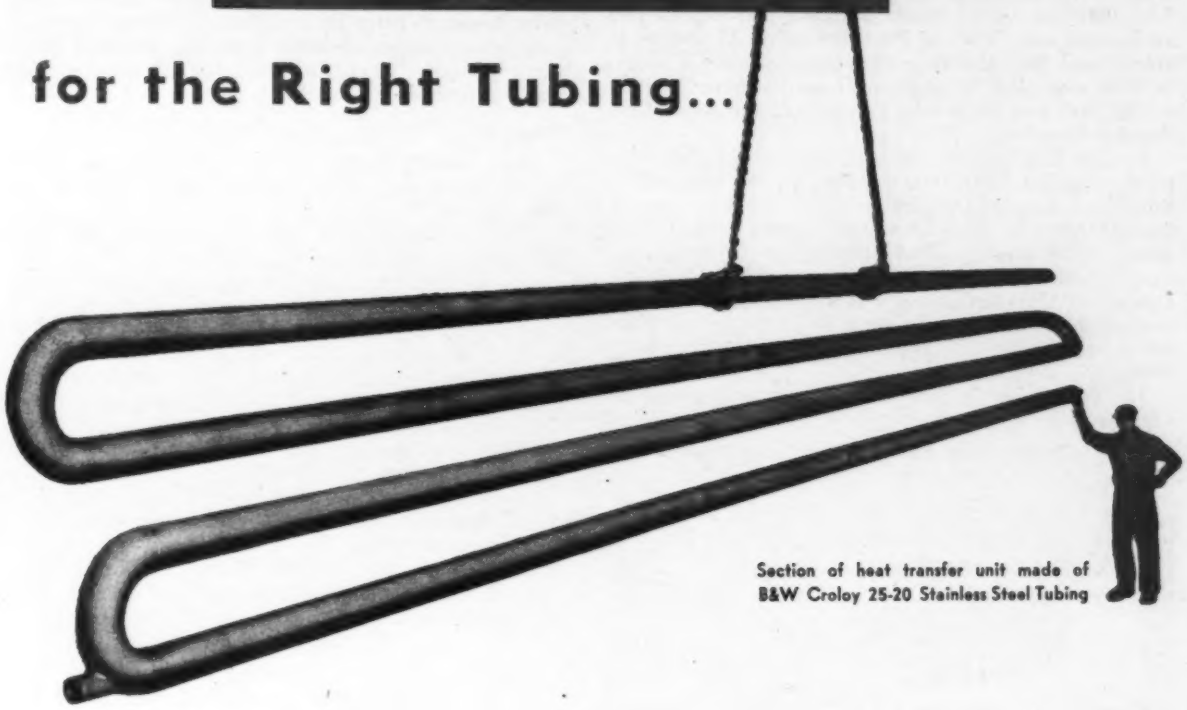

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tion in 1946 resulting in a corresponding increase in manufacturers' stocks.

Exports

Exports of newsprint paper from Canada in 1946 reported by the Dominion Bureau of Statistics, were 3,857,000 tons, valued at $265,790,000. This represented an increase over 1945 of 798,000 tons or 26 percent in volume and $86,342,000 or 48 percent in value. Exports in 1946 exceeded the previous record volume in 1937 by 402,000 tons or nearly 12 percent, and more than doubled in value.

For the first time in history Canadian newsprint exports exceeded $200,000,000. The nearest approach to this figure was $179,448,000 in 1945. Of these exports 3,323,000 tons or 86 percent were shipped to the United States. This was a gain of 789,000 tons or 31 percent over shipments in 1945 and was an all-time high for exports to that destination. Overseas exports in 1946 amounted to 534,000 tons or 9,000 tons greater than last year but were 123,000 tons below the peak year of 1940.

The record for the past twelve years as reported by Ottawa follows:

NEWS PRINT EXPORTS FROM CANADA
(Short Tons)

	U.S.A.	% of Total	Overseas	% of Total	Total
1946	*3,323,000	86.2	534,000	13.8	3,857,000
1945	2,534,000	82.8	525,000	17.2	3,059,000
1944	2,409,000	85.9	397,000	14.1	2,806,000
1943	2,545,000	90.6	265,000	9.4	2,810,000
1942	2,792,000	92.9	213,000	7.1	3,005,000
1941	2,762,000	84.7	500,000	15.3	3,262,000
1940	2,586,000	79.7	657,000	20.3	3,243,000
1939	2,207,000	83.0	452,000	17.0	2,659,000
1938	1,938,000	80.0	487,000	20.0	2,425,000
1937	2,899,000	83.9	556,000	16.1	3,455,000
1936	2,399,000	80.2	594,000	19.8	2,993,000
1935	2,052,000	79.7	523,000	20.3	2,575,000
12-Yr. Ave.	2,537,000	84.2	475,000	15.8	3,012,000

* Note:—There is a lag between official reports from Ottawa of exports to the U. S. and the Washington report of imports from Canada referred to later.

Ninety-three percent of the newsprint produced in Canada last year was shipped to foreign markets. Canadian exports were widely distributed with more than 60 countries all over the world depending on Canada for at least a part of their requirements.

Newfoundland exported 359,000 tons of newsprint in 1946 which was 43,000 tons or 14 percent more than the preceding year. Shipments to the United States aggregating 208,000 tons were 86,000 tons or 70 percent greater than in 1945 but still were 9,000 tons below the best previous year—1941. Exports to overseas destinations totaled 151,000 tons which was 43,000 tons or 22 percent below 1945 and almost 20,000 tons under the ten-year average.

United States newsprint manufacturers report shipments of 8,000 tons in 1946 direct to foreign markets which was 10,000 tons below 1945 and also was lower than in any year since 1939.

Altogether the North American newsprint industry shipped 693,000 tons of paper to consumers in other parts of the world compared with 737,000 tons in 1945 and 582,000 tons in 1944.

Imports

Imports of newsprint paper into the United States in 1946 according to official reports from Washington amounted to 3,490,000 tons of which nearly 94 percent came from Canada, slightly under 6 percent from Newfoundland and four-tenths of 1 percent from Europe. This was the largest volume of newsprint ever imported into this country, exceeding the 1945 imports by 821,000 tons and those of the previous peak year of 1937 by 173,000 tons.

Imports from Canada of 3,272,000 tons were the greatest on record. The 205,000 tons of newsprint from Newfoundland were, with the exception of 1941, the largest quantity ever reported. The 13,000 tons of European newsprint consisted of 12,000 tons from Finland and 1,000 tons from Sweden. Finnish newsprint began to enter this country in September of last year after a lapse of more than five years, while the small quantity from Sweden reported for December was the first since May 1940.

Stocks

Stocks of all North American producers on December 31, 1946, were 162,000 tons. This was 19,000 tons or 13 percent above those held by them a year earlier and higher than at the end of any year since 1942. Total mill stocks at the end of the year represented about 1½ weeks' production at the average weekly rate attained last year. Stocks on hand or in transit to the newspapers reporting to the A.N.P.A. amounted to 293,000 tons, making a total of 455,000 tons for the two groups.

Total stocks at the end of 1945 for all newsprint manufacturers and A.N.P.A. publishers were 409,000 tons, indicating an increase of 46,000 tons at the end of 1946. However, at the rate of consumption prevailing in December, these publishers had six days less supply than a year earlier. Moreover they had fewer days' supply on December 31, 1946, than at the end of any year since 1925. In view of the present box car shortage and other possible delays in transportation, publishers' stocks are not excessive and in some cases even inadequate.

Consumption

The 525 newspapers reporting to the A.N.P.A. used 3,136,000 tons of newsprint paper in 1946, an increase of 681,000 tons or 28 percent over consumption in 1945. It was also 190,000 tons or 6 percent greater than the earlier record total of 1941.

The present estimate is that these publishers accounted for 73 percent of total consumption last year. On the basis of this assumption, 4,296,000 tons of newsprint was consumed by all users in the United States. This was 816,000 tons or 23 percent above the preceding year and in both tonnage and percentage the increase was the largest ever recorded in any year over its predecessor. It was also 366,000 tons or 9 percent more than in 1941.

Under war-time governmental controls consumption of the larger publishers was curtailed to a greater extent than that of the small users. However, with the lifting of restrictions, usage by the larger newspapers showed a greater percentage increase than did total consumption.

Newsprint consumption, population in the United States and the calculated pounds of paper per capita in the past ten years are as follows:

Year	*Population*	*News Print Paper Used* Tons	*Per Capita*
1937	129,257,000	3,830,000	59.3
1938	130,215,000	3,458,000	53.1
1939	131,878,000	3,550,000	54.1
1940	132,817,000	3,730,000	56.2
1941	133,923,000	3,930,000	58.7
1942	134,633,000	3,800,000	56.4
1943	136,497,000	3,650,000	53.5
1944	138,101,000	3,250,000	47.1
1945	139,621,000	3,480,000	49.8
1946	140,840,000	4,296,000	61.0

In the period since 1929 consumption of newsprint

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has failed to keep pace with the growth in population. However, per capita consumption in 1946 rose sharply to 61 pounds, only a little more than a pound under the all-time high of 1929.

Sizes

Leading Sunday newspapers in the United States averaged 84 pages last year, a substantial gain of 14 pages over the average in 1945 but still 4 pages below 1941, 2 pages under 1940 and 7 pages less than the average in 1930. The smallest increase—7 pages—over the corresponding month of the preceding year, occurred in January, while the greatest increase was in April when an average of 19 pages more were printed. There also were increases of 18 pages in July and 17 pages in November and December over the corresponding months of 1945. While Sunday newspaper sizes in 1946 were materially higher than in the two immediately preceding years, they still are considerably less than the sizes prevailing prior to 1930.

Leading daily newspapers averaged 27 pages in 1946 which were 5 pages more than in 1945, as large as in 1941, but 5 pages below the high average of 1929. The largest monthly increase over the preceding year was that of July when an average of 7 pages more was recorded. However, the July 1945 figure was abnormally low due largely to the fact that New York City newspaper sizes were reduced because of the strike, preventing delivery of their papers for approximately half of that month.

Circulations

Complete figures of newspaper circulations in the United States are not yet available for 1946, but on the basis of information at hand it appears that the uninterrupted rise which began in 1939 is still continuing and that circulations are now at an all-time high level.

A survey covering the six-month period ending September 30, 1946, based on Audit Bureau of Circulation figures, estimated by *Editor & Publisher* to represent two-thirds of the weekday and three-fourths of the Sunday circulations in the United States, indicates a gain of nearly 5 percent for the dailies and more than 9 percent for Sunday editions over the same period of 1945. Corresponding increases over 1944 were 11½ percent and 15 percent respectively. Of the dailies, morning newspapers increased 7 percent over 1945 while the increase for the evening papers was approximately 2½ percent.

There had been some thought that with the cessation of hostilities newspapers would not be in as great demand as during the war, but such has not been the case. During the six-month period ending September 30, 1946, there were no such events as President Roosevelt's death, V-E and V-J days to boost circulations, yet a sizable gain was recorded over the preceding year. It is also interesting to note that this increase in readership comes at a time when newspapers generally have raised their newsstand and home-delivery prices. The five-cent dailies and fifteen-cent Sunday papers are not uncommon. It has been calculated that $803,593,000 have been paid by the public for daily and Sunday papers in the United States and Canada in 1945, which was a 5 percent increase over 1944, and presumably will increase further in 1946.

Advertising

All three major media of publicity — newspapers, magazines and radio — showed increases in 1946 over 1945, but it is significant that the best relative showing was made by newspapers.

Newspapers

Advertising in newspapers in the 52 major cities of the United States tabulated by Media Records amounted to 1,729,713,000 agate lines in 1946. This figure exceeded the total for any year since 1929. The increase over 1945 amounted to 338,084,000 lines or 24 percent, but on the other hand, the total was 167,500,000 lines or nearly 9 percent below 1929.

There were substantial increases in every month of last year compared with the corresponding month in 1945. The largest increase was 30 percent in August; the smallest was 17 percent in November. Percentage increases from August through November followed a downward trend which was reversed with a 25 percent increase in December. Total linage in the months of August and December was greater than in any corresponding months on the record which goes back to 1928.

All classifications of newspaper advertising linage registered increases over 1945 as follows: retail 26 percent, classified 32 percent, general 8 percent, automotive 22 percent, and financial 19 percent.

Periodicals

Magazine advertising linage as reported by *Printers' Ink* while increasing only 14 percent over 1945, was nevertheless more than double the volume in 1941. While every month of last year showed an increase over the corresponding month of 1945, the rate of percentage increase was uneven. January, with an increase of 24 percent, had the greatest gain with April and May 18 percent above the preceding year. From that point on there was a gradual decline to the month of November which was only 7 percent above November 1945. In recent years, prior to 1946, periodical advertising had shown a considerably greater relative increase than had newspaper advertising.

Radio

Total expenditures by advertisers for radio time in 1946 showed an increase of 5 percent over 1945—the same as in 1945 over 1944—but the rate of increase was considerably below that in years prior to 1944.

The National Association of Broadcasters estimates radio gross billings in 1946 at $433,000,000 as compared with $411,500,000 in 1945. Of this total, national network billings are estimated at $191,000,000 last year and $190,700,000 in 1945.

An indication of the competition that the broadcasting industry and other advertising media will have to face in the future is shown in the large number of licenses issued by the Federal Communications Commission since the lifting of the wartime ban on operation of new radio stations. In the period since controls were removed last October to about the end of November, the F.C.C. has issued grants for 480 standard stations—29 more than were licensed in the eleven-year period ended in 1945.

Outlook

The current outlook for the newsprint industry in North America is for continued high demand. With the improvement in the situation compared with war years, with regard to the supply of raw materials and labor, it is possible that there may be a sizable increase in production. Even if there should be some business recession in 1947, the world usage of newsprint is expected to absorb all that this continent can produce.

Due to increased facilities:

CORPOLIN*

is promptly available in large quantities.

Properties:

Powerful moisture attracting agent, surpassing Glycerin

SPEC. GRAVITY:	1,425 (43 Bé)
COLOR:	practically colorless
ODOR:	none
TOXICITY:	Non-toxic
SOLUBILITY:	soluble and miscible with glycerin, the glycols, sugar and urea solutions, amines, etc.
INFLAMMABILITY:	non-inflammable, makes paper non-inflammable.
IONIC RANGE:	may be applied within the ranges of pH7, 5 to pH 10.

Corpolin is preferred for paper impregnation, when moisture attraction is essential.

*REG. U. S. PAT. OFF.

THE AKTIVIN DIVISION

Heyden Chemical Corporation

393 Seventh Avenue, NEW YORK 1, N. Y.

The Case For Casein

Production of 18,175,000 Pounds in 1946 Gain of 53 Per Cent Over 1945, 46 Per Cent Drop From 1940-44 Average. Prospect of 45,000,000 Pounds For '47

By Nils Anderson, Jr., Vice President, Casein Company of America

Nineteen hundred forty-six was a chaotic year for producers, importers and, of course, consumers of casein. Prices were controlled for ten months of the year by the Office of Price Administration. At the earlier part of the year the ceiling price was 24 cents a pound, the same ceiling that was established by the Office of Price Administration early in 1943. This price was established to fulfill the increased demand for dry non-fat solids with which casein had to compete for the available supply of skim milk. As a result very little casein was made as long as the ceiling price remained in effect at 24 cents per pound. Even when OPA raised the ceiling price from 24 cents to 33 cents per pound early in the spring, very little activity was shown in producing casein in spite of the seasonal surplus of skim milk during the flush season. Dairy products actually froze casein's unfavorable price position.

During the month of July 1946 when OPA was temporarily suspended for one month, prices of casein soared immediately from 33 cents to as high as 43 cents and quantities of casein began to move to meet the supply and demand. On August 1st prices were reestablished and the price of 33 cents just made the casein situation more critical because it was impossible to compete with other dairy prices, and it was impossible to import Argentine casein because their prices exceeded our ceiling price by ten cents per pound.

By the time OPA was finally abolished, stocks of casein were at an all-time low not only in producers' hands but also consumers' hands. The terrific impact of everyone buying at one time made prices soar to as high as 55 cents per pound, and casein was sold in the United States at prices ranging from 48 cents to 55 cents per pound during November-December of 1946 and for the first ten days in January. After January 10, 1947, the price of casein began to level down.

World-wide position for the past four years in the United States has depended on the import of casein from the Argentine, and during 1946 their f.o.b. price exceeded our ceiling price throughout the regime of the Office of Price Administration. It was only at times when the OPA raised the ceiling price that large quantities of casein were permitted to move freely to the United States. But it was only a matter of several weeks before the quoted price in the Argentine exceeded our ceiling price here in the United States.

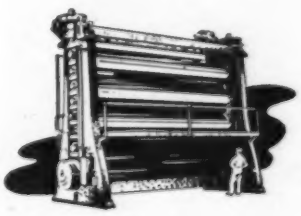
The increase in the price of casein in the Argentine was due to the fact that several months after V-J Day 1945, international controls were lifted and those countries which had been denied their normal casein requirements quickly made their needs felt. There was a period in the summer and early fall of 1945 when casein was relatively plentiful but, unfortunately, United States users were timid about buying ahead and placed what proved to be altogether too much reliance on the prospect of casein production within the United States

EXPORTS FROM THE ARGENTINE
Metric Tons

Country	1945	1946									Total 1946
		1st 4 Mos.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Africa	....	....	....	....	....	....	....	....	....	....	....
Barbados	....	....	....	....	....	....	....	....	....	....	....
Belgium	575	135	7	....	3	....	....	....	6	15	166
Bolivia	....	....	....	....	....	....	....	....	....	....	....
Brazil	787	3	...	....	....	368	239	70	130	10	840
British Guiana	....	....	....	....	....	....	....	....	....	....	....
Canada	....	....	....	....	....	....	....	....	....	....	....
Canary Islands	....	....	....	....	....	....	....	....	....	....	....
Colombia	23	....	3	....	....	....	....	....	....	....	3
Costa Rica	....	....	....	....	....	....	....	....	....	....	....
Cuba	....	....	....	4	....	4	1	....	....	....	9
Chile	105	52	12	1	38	....	6	31	5	5	150
Dominican Republic	....	....	....	....	....	....	....	....	....	....	....
Dutch Possessions	....	....	....	....	....	....	....	....	....	....	....
Ecuador	....	....	....	....	....	....	....	....	....	....	....
England	5303	2750	350	750	250	1100	750	407	100	482	6939
France	....	570	....	5	....	....	250	150	40	100	1115
Guatemala	....	....	....	....	....	....	....	....	....	....	....
Haiti	....	....	....	....	....	....	....	....	....	....	....
Italy	....	....	....	....	....	....	30	....	....	....	30
Holland	250	76	130	15	210	25	....	....	....	....	456
Honduras	....	....	....	....	....	....	....	....	....	....	....
Jamaica	....	....	....	....	....	....	....	....	....	....	....
Malta	....	....	....	....	....	....	....	....	....	....	....
Mexico	201	59	....	10	....	....	49	....	....	....	118
Netherlands Guiana	....	....	....	....	....	....	....	....	....	....	....
Nicaragua	....	....	....	....	....	....	....	....	....	....	....
Norway	400	223	59	....	117	....	....	....	....	....	399
Panama	....	....	....	....	....	....	....	....	....	....	....
Paraguay	....	....	....	....	....	....	....	....	....	....	....
Peru	6	3	....	....	1	....	....	....	....	....	4
Puerto Rico	....	....	....	....	....	....	....	....	....	....	....
Portugal	....	10	....	20	....	....	2	....	....	21	53
San Salvador	....	....	....	....	....	....	....	....	....	....	....
South Africa	376	10	106	10	20	45	....	12	....	....	203
Spain	1500	1002	400	....	....	....	225	....	....	....	1627
Sweden	1439	392	45	....	13	....	20	....	90	90	650
Switzerland	112	225	....	....	....	....	....	60	....	....	285
Trinidad	14	....	....	....	....	....	....	....	....	....	....
United States	22529	4980	3296	1474	2836	1143	1169	1224	960	1847	18929
Venezuela	51	25	....	15	25	....	....	....	....	15	80
Others	....	38	....	....	....	13	10	20	....	....	81
Greece	....	....	....	....	5	1	3	....	7	1	17
China	....	....	....	....	20	59	30	....	....	....	109
Palestine	....	....	....	....	....	4	13	....	....	....	17
Totals	33671	10553	4408	2304	3538	2762	2817	1974	1338	2586	32280

EXACTING MEN

& MEASUREMENTS



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Ask our sales engineers about performance--and our exacting work.

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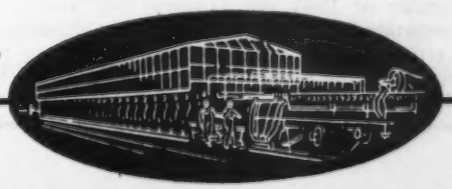

CASEIN AT WAR—1940-1944

Item	1940 Million lb.	%	1941 Million lb.	%	1942 Million lb.	%	1944[2] Million lb.	%
Adhesives	6.8	11.3	9.8	12.7	9.6	14.9	12.6	19.3
Plastics	2.1	3.5	6.7	8.7	5.7	8.9	5.8	7.9
Paint	5.4	9.0	6.9	8.9	8.2	12.8	6.1	8.4
Paper	42.1	69.9	47.0	60.7	32.0	49.7	27.4	37.6
Miscellaneous[1]	3.8	6.3	7.0	9.0	8.8	13.7	21.0	28.8
Total	60.2	100.0	77.4	100.0	64.3	100.0	72.9	100.0

Based on industry reports submitted to War Production Board. Complete data for 1943 is not available.
[1] Includes rubber compounding, building materials, leather, textile, insecticides, food and pharmaceuticals.
[2] Allocated quantities. Consumption was probably 5 to 10 per cent lower.

during 1946. It can be quickly realized by looking at the table concerning exports from the Argentine that the world-wide demand was truly in effect.

Foreign countries would have purchased larger quantities of casein from the Argentine although they did not because they could hardly recognize the impact of United States' purchases when the ceiling prices were raised in this country. Therefore when we stopped buying, because of ceiling price control, they would start buying and the price would naturally go up still further. The Argentine is the major source of casein for the world and in the past has been the dominant factor for foreign countries. They will no doubt continue to be the major factor because there is an excessive demand for casein throughout the world. There is no question but that high prices have curtailed this demand but when prices are lower it is expected that the casein market will be very brisk.

In the table showing the exports of casein from the Argentine during 1945 and 1946, Japan and Germany show no figures. Conditions in these countries have not yet permitted free trade and, therefore, no imports have been made by hem. However, prior to the war both Germany and Japan took about fifty percent of the total production of the Argentine. Sometime soon in order for these countries to get their industrial machines operating again, they will be importing casein from the Argentine.

Argentine Takes Control

On August 23, 1946, the Argentine Government through its agency "Instituto Para La Promocion Del Intercambio" took over the production and export of casein, along with other dairy products, and for many weeks importers and consumers here in the United States were in a quandary as to how they could operate. It was just as well that they confused the situation further because the prices were definitely higher than our ceiling prices and there was no reason for the Government to lower the price to meet our ceiling price of 33 cents. About the time that our Office of Price Administration was abolished the Argentine Government set a price of 40.5 cents f.o.b. Buenos Aires. Contracts were made on this basis immediately and perhaps 24 to 48 hours later the Argentine Government cancelled out contracts that were made and raised the price two cents per pound. Under these conditions trade was actually chaotic and no one knew what their legal rights were in this strange way of doing business. Contracts were made for prompt delivery, but it was almost two months before deliveries began to move after original contracts had been placed.

The reason for delayed deliveries on casein during December of 1946 and January 1947 was purely because producers in the Argentine would not sell to the Government at 20 cents per pound and have the Government sell the casein to the United States for a price of 42½ cents, or over 100 percent profit for the Argentine Government. It was not long, however, before shippers in the Argentine got around this point, otherwise it would be unlikely that shipments of casein from the Argentine would have been made as early as they were.

The entrance of the Argentine Government into the casein business tended to create some stability in the market in spite of high prices. It is quite possible that prices of casein could have gone higher than they did. For instance, there are many companies who openly admit that if casein had gone to $1 per pound they would have bought it anyway. The Argentine Government was not too far out of line at the time they set this price because it was generally known that producers here in the United States could not manufacture casein for anything less than 48 cents.

Downward Trend Sets In

In October and November of 1946, no one could foresee with certainty that the military demand and foreign demand for dairy products was going to slip. Most observers felt that the demand would continue approximately on the same basis, making their conclusions on the basis that United States was going to feed European countries or in some way provide edibles for starving nations. At any rate the demand for edible dairy products is as strong as it ever was, only a different method of procuring these edible products for these European countries is necessary. Just which countries have the dollars to buy them is questionable and also whether these countries will wish to part with their dollars to buy all the food that they need remains to be seen.

At any rate the downward trend on the price of casein started sometime around the middle of January, at which time it was indicated by producers of casein that they were going ahead to produce. This made many consumers who had over bought look over their inventory position and those who thought they might be a little bit long decided to unload their excess stocks at a loss. This immediately brought about a weakening in the casein price. Although this method of disposing of stock created an unsettled condition in the casein market,

U. S. CASEIN PRODUCTION AND IMPORTS TO U. S. FROM 1919

Year	Domestic Production[1] 1,000 pounds	Imports for Consumption[2] 1,000 pounds	Production Plus Imports 1,000 pounds
1919	14,407	17,077	31,484
1920	11,526	21,239	32,765
1921	8,076	9,717	17,793
1922	6,927	14,342	21,269
1923	15,548	26,490	41,038
1924	20,759	17,750	38,509
1925	16,660	18,804	35,464
1926	16,953	26,281	43,234
1927	18,033	24,210	42,243
1928	22,151	28,651	50,802
1929	30,537	27,583	58,120
1930	41,965	18,500	60,465
1931	35,335	3,503	38,838
1932	24,428	1,201	25,629
1933	24,087	8,142	32,229
1934	37,331	1,491	38,822
1935	37,638	3,230	40,868
1936	46,140	16,209	62,349
1937	67,467	5,210	72,677
1938	48,549	417	48,966
1939	40,878	15,832	56,710
1940	46,616	24,523	71,139
1941	47,371	41,518	88,889
1942	40,000	16,833	56,833
1943	18,388	32,000	50,388
1944	14,883	47,826	62,709
1945	13,330	55,000	68,330
1946	18,175	42,000est.	60,175est.
1947	.. ..	.....	.....
1948	.....	.....	.....
1949	.....	.....	.....
1950	.....	.....	.....

[1] Source: Production of Manufactured Dairy Products issued annually, Bureau of Agricultural Economics, U. S. Dept. of Agriculture.
[2] Source: 1919-1941 Foreign Commerce and Navigation of the U. S. 1942 Monthly Summary of Foreign Commerce, Bureau of Foreign and Domestic Commerce, U. S. Dept. of Commerce.

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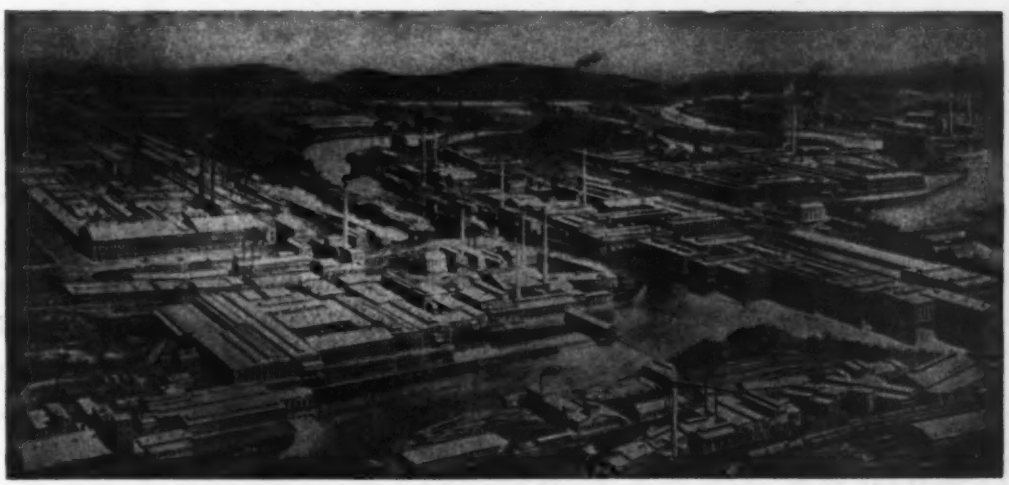

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Seventeen years ago, Lukens Steel Company began the manufacture of its first clad metal —Lukens Nickel-Clad Steel. Other economical Lukens Clad Steels followed—Inconel-Clad Steel and Monel-Clad Steel.

Now, Lukens offers a complete line of Stainless-Clad Steels, produced by the same method as its earlier clad steels.

In the Lukens' method, a light layer of the proper type of solid stainless steel is bonded, by hot rolling, to a plate of carbon or alloy steel. This method insures uniform thickness of cladding and a permanent bond.

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OF LUKENS STAINLESS-CLAD STEELS

★ **Corrosion resistance and product protection of solid stainless steel, at appreciable savings in cost over solid stainless.**

★ **Any standard specification stainless cladding, including straight chromium types 410 and 430 and chromium-nickel types 304, 316 and 347.**

★ **Uniform thickness of cladding.**

★ **10% or 20% clad usually furnished, but any percentage from 5% to 50% obtainable.**

★ **Any quality carbon or alloy steel backing plate depending on the requirements.**

★ **Heat conductivity far superior to solid stainless. Better heat transfer properties provided by the complete bonding of the stainless cladding with the steel backing plate.**

★ **Readily fabricated.**

★ **Plates from 3/16" to over 3" thick, or up to 162" wide. It is always cheapest to fabricate the widest plate suitable.**

★ **Flanged and dished heads of all styles and sizes to over 18' in diameter. Lukens has specialized in forming heads for over 55 years.**

Additional information on Lukens Stainless-Clad Steels is offered in the new Bulletin 338; on other Lukens Clad Steels, in Bulletin 255.

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producers immediately took cognizance of the situation and began to curtail production. A further inquiry showed that substantial quantities of casein from the Argentine were afloat and everyone knows that this casein costs 48 cents or more. Until consumers of casein have actually used up their high priced material and run down their stocks to as low a point as possible, there will be little buying done and, at the same time, very little production will be made until consumers commit themselves on their future requirements.

Consumers are expecting a lower price and justifiably so. Lower prices will become prevalent after the spring flush is well under way and it is expected that prices will be well within reason and consumption naturally will be greater.

Usage of Casein

Casein was used in a diversified number of industries tabulated in the table entitled "Casein at War." It is obvious that the paper industry consumes the largest percentage of the casein produced. During 1946 paper converters used substantial quantities of casein, probably 35,000,000 pounds. This is less than the 1941 usage of 47,000,000 pounds of casein. It is understandable that the paper industry used less casein in 1946 because of the shortages that occurred spasmodically and also because of the constantly increasing price. There were also substitutes for casein that were available in limited quantities. Although these are expensive materials also and are not in too great a supply, they were used where and when available. It is also realized that the paper industry during 1946 was working at top speed. The demand for paper and coated paper far exceeded the supply and it was possible for many sellers to sell lower grades of coated paper than heretofore, also pulp and pigments and other chemicals being in short supply they used their raw materials to greater advantage in production and also profit-wise. Many paper coaters predict that competition will force them to use larger quantities of casein as the paper situation eases. Also, the price of casein showing a lowering tendency will naturally stimulate greater usage of casein for paper coating. If the price of casein ranges around 25 cents to 30 cents, or possibly lower, a record consumption of casein will no doubt be used.

Casein in the glue industry was extensively used in 1946 and will, no doubt, be used in possibly larger quantities during 1947. Shortages of other types of glues such as animal and resin glues have made it possible for casein specialty adhesives to step in and do a job. When and if prices are substantially lower it is expected that larger quanties will be used.

Containers, pigments and other chemicals were the bottlenecks in the manufacture of water paints, where substantial quantities of casein have been used during 1946. This year should show a record for the consumption of casein in paint manufacture. The demand for this type of paint is well in excess of the supplies which are components of these coating materials.

Other uses of casein in industries such as the plastics, synthetic fibre, rubber, leather and textile trades seem enthusiastic about consumption of casein in about the same quantities as they used during 1946.

Generally speaking the entire production of casein in past years, except during periods of great collapses, has been consumed year in and year out. Casein production is limited entirely by the availability of skim milk and also to the resistance of increasing prices by the consumer. As soon as buyers resist prices production is curtailed. And the skim milk is diverted to other edible dairy foor products, or turned back to the farm for feeding hogs or other animals.

Since this country consumes anywheres from 70 to 90 million pounds of casein annually, one could expect that the entire production of casein this year will be sold by producers and probably some will have to be imported from the Argentine. Estimates by various producers of the production of casein in 1947 show approximately 45 million pounds to be made in 1946, which means that the U. S. will have to buy no doubt from the Argentine sometime during the year.

Statistics on production of casein in the United States and also in the Argentine are shown on the table entitled "U. S. and Argentine Position" which shows that the United States imported approximately 60 percent of the Argentine production. In 1946 imports to the United States from the Argentine showed a decline. This was due primarily to delays in shipping because of Argentine Government control and also because of high prices. It is interesting to note that as soon as the Office of Price Administration was abolished production immediately increased responding to a free market and permitting people to pay a price for casein which would stimulate production and permit paying equally as high prices for skim milk as edible products. This table on statistics will be of interest to readers for comparing our production with the United States as well as the tonnage that we have imported in the past.

Another table which will be of interest and should be studied is the table entitled "U. S. Casein Production and Imports to United States from 1919." When studying these tables the reader should understand that the Argentine flush production is between the months of September and February, whereas our flush commences in March and ends about July. By keeping this in mind, the buyer of casein should recognize that it is not necessary to lay up large stocks of casein and likewise, the domestic producer should guide himself accordingly. On the other hand with the Argentine Government maintaining high prices on casein, and if ours remains at a lower level, the consumer may wish to protect himself by carrying a rather long position.

Conclusion

Generally speaking, casein users will be expecting lower prices in the next three months. Although the demand is expected to be as great for 1947 as in 1946,

CASEIN—U. S. AND ARGENTINE POSITION

	Dry Casein Production U. S. A. Short Tons			Argentine Imports to U. S. A. Metric Tons		
	1944	1945	1946	1944	1945	1946
Jan.	438	333	177	3250	432	895
Feb.	474	355	237	803	1054	2205
March	596	507	383	1637	3693	1255
April	805	781	670	1133	2640	625
May	1185	1209	1282	202	1804	3296
June	1463	1375	1710	3013	3168	1474
July	843	870	1155	2750	1202	2836
August	480	405	775	1673	2899	1143
Sept.	374	320	513	2020	1245	1169
Oct.	322	247	460	2673	1409	1224
Nov.	203	130	650	....	650	960
Dec.	258	145	1075	3341	2333	1847
Totals	7441	6677	9087	22495	22529	18929

	Total Argentine Exports Metric Tons			Argentine Production Metric Tons		
	1944	1945	1946	1944	1945	1946
Jan.	4650	1791	1305	3250	2731	3000
Feb.	3727	1428	3949	2832	2690	2500
March	2472	4078	3471	2743	3308	2500
April	1149	3159	1828	2345	2748	2773
May	1349	2933	4408	1915	2296	2675
June	4370	4124	2304	1705	1673	2650
July	4044	1880	3538	1562	1341	1974
August	3469	3950	2762	1677	1565	2047
Sept.	2227	2342	2817	1762	2361	2434
Oct.	3280	1917	1974	2306	2631	3112
Nov.	1330	1852	1338	3193	3031	3419
Dec.	3458	4292	2586	3050	2834	4000
Totals	35525	33746	32280	28340	29209	33085

The General American Conkey Self-Supporting Evaporator is functionally identical with, equally accessible, and operates and produces no differently from its predecessor, the Conkey long tube vertical type evaporator.

This modern type evaporator (patents applied for) provides the following advantages over conventional evaporator construction:

1—*Lower Installed Cost*—
- a—No structural supports required.
- b—Low erection costs due to unit effect (Vapor body, heating element and entrainment separator shipped completely assembled).
- c—Less floor space required.
- d—Climate permitting, may be set out of doors.

2—*Operating Advantages*—
- a—Lower steam-vapor pressure drop losses.
- b—Fewer points for vacuum leakage.
- c—Real accessibility to outside tube areas for cleaning.
- d—Lower maintenance due to unit construction and absence of structural steel supports.

A General American engineer will gladly give further details to your operating department.

Self-Supporting Evaporators

EQUIPMENT FOR PULP & PAPER MILLS

Digesters	Filters	Storage Tanks
Blow Tanks	Kilns	Bins
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GAT X GENERAL AMERICAN

that demand will be supplied by domestic production by a greater percentage than last year. Some Argentine casein will probably be imported.

Stocks of casein in the United States December 31, 1946, were probably at an all-time low, being 2,250,000 pounds, a decrease of 52 percent from the year earlier and the smallest on record. Stocks held at the end of earlier years were as follows:

1944 — 3,350,000 pounds
1943 — 4,500,000 pounds
1942 — 9,069,000 pounds
1941 — 6,768,000 pounds

Producers in view of a declining market are reluctant to over-produce and are working on orders which are scheduled in advance by their customers.

In view of the fact that the four big months of production lie just ahead of us, March, April, May and June, consumers should gauge their requirements carefully so that producers can gauge their production to fill consumers' needs for the balance of the year. If consumers would commit themselves with producers on such a basis throughout the year, it is felt that there would be greater stability in the casein market. If consumers are not cognizant of this situation they should study their position further in order to cooperate with their producers. Otherwise, the only other course is speculation which causes fluctuating prices. One of two things happens: 1) over-production; 2) under-production. Over-production occurs because producers feel that their production will be bought and consumed. If this is not realized prices drop unreasonably so and material is sold at a loss for all who have produced. Under-production generally occurs because the producer is not satisfied that his production will be sold. Yet, the demand overtakes the supply, the flush has gone by, and the producer in order to meet the demand must pay higher prices for skim milk in the dry season than if he had purchased skim milk to make casein during the flush.

Delaware Valley TAPPI Discusses Paper Making Felts

The February meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry was held as usual at the Engineers Club of Philadelphia on Friday evening, February 7th. The representatives of the U. S. Rubber Company acted as social hosts for the evening.

The Section Chairman, John Macadam of National Vulcanized Fibre Company, turned the meeting over to John Weidner of Container Corporation of America, the Program Chairman. Before starting the regular technical discussion, Mr. Weidner introduced Rev. Joseph J. Malloy of St. Joseph's College who expressed his appreciation of the assistance of the men in the paper industry of this section in making the evening courses on paper making during the past several years so successful. These classes have been so popular that the college is now offering a three year course in paper making.

The subject of paper making felts was introduced by showing a motion picture illustrating every step in the design and production of felts for paper machines. This picture was obtained through the courtesy of Alan Boyd, the representative of F. C. Huyck & Sons in this district.

Mr. Weidner then introduced the speaker, Douglas Fronmuller of Scott Paper Company who described the study being made on felts at the Scott Paper Mills at Chester, Pa. These studies were initiated to find the causes of erratic felt life. These causes could be grouped into two categories: (A) those traceable to the felt itself, and (B) to machine conditions.

In addition to the record kept on the life and performance of each felt, the following types of tests were also made: (1) wet tensile, (2) wetting out, and (3) shrinkage.

Wet tensile tests can be made on the regular testing equipment without special conditioning. The results indicated that the wet warp threads retained only about 70% of their original dry tensile strength, but that the fill threads retained about 87-90% of their dry tensile strength.

The wetting out test may be defined as the time required for the wool to absorb about 100% of its weight in water, and its results may be correlated with the felt's effectiveness in absorbing water from the wet sheet being formed.

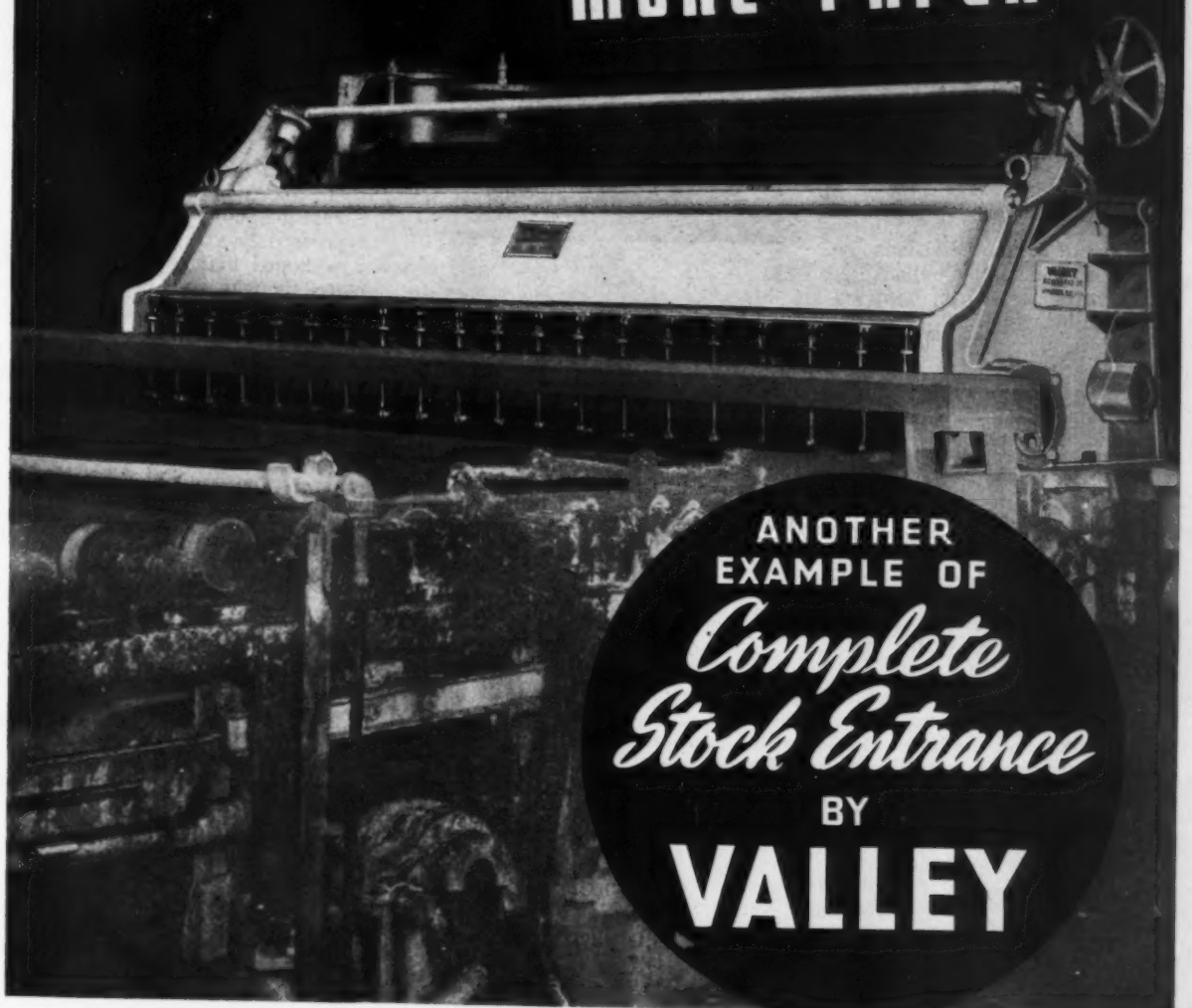
Shrinkage tests were made on 4 x 6 inch samples measured as accurately as possible before wetting and again after redrying. Excess changes in dimensions may predict behaviour of the felt in the wetting out process on the machine.

The felt life records including type showers used, number of washings, etc., together with the results of the tests made on the felt after failure not only assist in selecting proper types of felts for each machine, but also indicate faulty sets of wringer rolls or press rolls. The paper machine itself must be kept in good order to get good felt life.

Various washing methods and anti-bacteria treatments were also discussed. Mr. Fronmuller also suggested that although their studies indicated that some of the extra strength built into the warp threads could be used advantageously in the fill threads which bear the brunt of wear on the press rolls, each machine presents an individual problem in the selection of felts.

Those present included: E. J. Albert, A. I. Andrews, E. T. Boehuncke, Alan R. Boyd, Arnold M. Brown, F. W. Brainerd, C. L. Brickman, H. C. Brill, Lloyd Bixler, John Carson, C. M. Connor, J. R. Coursault, Thage Dahlgreen, J. C. Dieffenderfer, W. P. Dohne, J. Edward Doyle, Gerard J. Eberz, James C. Eaton, N. V. Edmonson, P. C. Evanoff, J. S. Evans, John Fachet, Harrison J. Farra, G. A. Farrah, Jeanne H. Fisher, Douglas Fronmuller, John S. Gates, Hobart L. Geer, J. D. Gercke, Frederick W. Goetz, J. W. Goldring, Jesse F. Good, John M. Greason, Ralph E. Green, A. E. Griffin, Samuel Hagner, E. A. Hanna, Lois V. Hans, J. C. Harper, H. F. Hoffman, M. Huff, Andy Jackson, William D. James, S. T. Jamison, Thos. D. Johnson, Jr., Harry C. Kinne, Jr., Heinz A. Lips, Geo. D. Lord, J. Macadam, John A. Manley, John W. MacAllister, R. E. March, G. B. Martin, E. P. McGinn, D. Kenneth McCindy, Louis E. McGrath, Alex McInnes, H. C. Merritt, Edward C. Molin, D. H. Newcomb, Edgar Olsen, J. A. Paciello, Homer F. Ray, C. H. Rice, W. D. Rice, J. Carl Schmidt, Chas. A. Shubert, Mildred H. Simon, Clark E. Snook, W. R. Schlotterback, Maxwell Stettner, Oliver S. Sprout, Jr., Wayne D. Stephenson, Elliot I. Stokes, Howard Street, Lionel M. Sutherland, Geo. M. Suydam, J. S. Tipka, T. W. Toovey, James Traill, Roy H. Underdown, E. A. Walton, G. C. Walton, Kingdon R. Watt, A. E. Waugh, John P. Weidner, R. Wiggins, Ray Wilcox, William R. Willets.

THE PAY-OFF IS . . . HIGHER TEST A BETTER SHEET MORE PAPER



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TAPPI Looks Forward

Presidential Address of G. W. E. Nicholson,
President, Technical Association of the Pulp and Paper Industry

We are today meeting after having passed through the first postwar year with its many adjustments for the industry, as well as for the members of our association. It has been a very active year and our organization has grown still further with an increase of about six hundred members. A great number of members have returned from the armed forces to civilian life.

Committee work has been further extended during the year through over sixty committees, and undoubtedly the co-ordination brought about by appointing executive committee members as general chairmen of various divisions which was instituted about three years ago, has been helpful in bringing about excellent results. The association owes a great deal to the great number of members who are willing to serve and assume assignments at great personal sacrifice. The top management in the industry has taken a still greater interest in our work and has given us splendid support by encouraging their technical men to actively participate in the various activities of the association.

All the officers of your organization have given a great deal of thought to means and ways of further extending the services to the members, particularly on account of the increased membership as well as the many new technical developments in the industry.

Fall meetings have also become very cumbersome and the number of suitable places for meetings are limited on account of the hotel facilities required for larger groups. A new procedure relative to the Fall meeting therefore, was inaugurated by holding three smaller Fall meetings. By doing this we were also able to organize special programs for divisional activities, such as alkaline pulping and engineering, and we hope that later on this can be extended to acid pulping and groundwood. One meeting was held at Detroit, with a program arranged by Dr. Lewis covering supply, procurement, and utilization of various species of wood in the American pulp and paper industry. One meeting at Milwaukee was organized as an engineering conference with a special program of interest to power, maintenance, and construction engineers. One meeting was held at New Orleans and sponsored by the Alkaline Pulping and Chemical Products Committee under the general chairmanship of W. F. Gillespie. All three meetings were very well attended with the various sections of the country as well as Canada well represented and the participation in the discussions was very enthusiastic. A most favorable response to these meetings has been received and the officers of your organization therefore, are planning to continue and extend such meetings during the coming year.

Sectional meeting activities have increased still further. This is very encouraging as it is of the utmost importance that local sections carry out regular, well attended meetings with interesting programs. Such activities create interest among the young men and are helpful in developing technical thought, thereby also bringing about increased participation in the National Committee work. The local sections have in some cases sponsored National Committee activity. This, however, is only a beginning and it is hoped that a great deal more thought can be given to such a program as it would have a tendency to bring about more active National Committee work.

One new section, the Chicago Section, received its charter during the year. This organization was formerly known as the Chicago Professional Paper Group and has been very active for some years.

I wish to take this opportunity to commend the West Coast Section upon its outstanding accomplishments in furthering the aims of the Technical Association by frequent meetings, well organized programs, and active committee work. The development of leadership in the National Organization is fostered and brought about through outstanding work in the local sections, and for that reason it cannot be too strongly emphasized that the future of the association depends greatly upon the leadership of the local sections and the time and effort given to National Committee work.

A further review and study has been made during the year of the Technical Association's publication policy. Additional members were added to this committee which has held several meetings. Considering the magnitude of such study and the possible far-reaching consequences of any change, it will undoubtedly be some time before any definite recommendations can be made to the membership. We have reason to believe that the membership at large has no serious complaint about the present policy. However, such an important matter should be examined from time to time and any changes warranted carried out to meet the new conditions.

The Executive Committee held four meetings during the year and several meetings have been held with your secretary and vice-president, and here let me extend my thanks for their excellent cooperation. I personally and on behalf of the Executive Committee wish also to express to our Secretary, R. G. Macdonald, and the staff our appreciation for the splendid services given during another year.

AMBURSEN DAMS

SINCE the construction of the first AMBURSEN TYPE DAM at Theresa, New York, in 1903, about 400 of these structures have been built. Difficult foundation problems have been successfully solved, about 175 of the total number of AMBURSEN DAMS having been constructed on soft or porous foundations that prohibited the construction of any other permanent type of dam.

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WILTON DAM, SOUTHERN RIVER, NEW HAMPSHIRE. 1904
Municipal water supply. Rock foundation

PIERREPONT MANOR DAM, BEAR CREEK, NEW YORK. 1921
Northern N. Y. Milk Co.; storage. Shale foundation

40 BUILT FOR THE PULP AND PAPER TRADE

The partial height method of constructing AMBURSEN DAMS effects low initial cost and minimum carrying charges for hydro-electric and water supply developments, permitting economical future increase in height when required.

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British Columbia Electric Railway; power and storage. Rock foundation

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BRISTOL DAM, PEMIGEWASSETT RIVER, NEW HAMPSHIRE. 1932
New Hampshire Public Service Company; hydroelectric plant. Rock foundation

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I am happy to report that the finances of the association are very sound, and although it may be said that it is not the objective of the association to accumulate excessive funds but rather to give attention to ways and means of extending its services, it may be in order to inject a note of caution considering the inflationary trends in the country and the costs of services which are increasing.

It is interesting to note that during this last year there has been more exchange of technical information in our industry than during any previous year. Visits by engineers, operators, and executives from various sections of the United States and Canada have increased tremendously. This indicates not only an increase in momentum of new technical developments, but also a greater realization that we are dependent upon each other.

This development is significant and I believe we can truthfully say that the outstanding work covered by the Technical Association has to a great extent brought about this wholesome situation.

This trend also points to a still greater participation in our association by the technical men as well as the executives, and I firmly believe that we can look forward to the future with a great deal of expectation for our organization.

TAPPI Bibliography 1936-1945

We have just received a copy of the Bibliography of Paper Making 1936-1945 published by the Technical Association of the Pulp and Paper Industry and wish to congratulate the Association for making available this key to the literature of the industry for the past decade.

The Technical Association has been fortunate for many years in having the remarkable services of Dr. Clarence J. West in preparing these books both on an annual basis and on a collective basis when he has been able to bring together in one volume the record of books and articles published over several years. It is interesting to note that this third collective bibliography brings up to date the entire literature of pulp and paper manufacture since 1900.

A note of caution should be given to those who have the annual bibliographies in their libraries. The collective bibliography even in its 1153 pages does not include a record of the pulp and paper patents that have been issued since 1936. These are contained in the annual volumes and those for 1945 and 1946 will be published in the annual volume to be issued later this year.

The collective bibliography is an example of the fine cooperation between the Technical Association and the Institute of Paper Chemistry. The latter organization made possible considerable time on the part of Dr. West and others to the compilation of this volume.

The Technical Association has had an unusually fine record of not only bringing to the industry many fine reports on manufacturing developments but also the indices of the information published throughout the world on the subject. By making known these facts companies are enabled to make further progress without the necessity of duplicating past effort. It is a fine service and most appreciated by those responsible for the technical advancement of the industry.

Copies of the collective bibliography may be obtained from the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $10.00 per copy.

Statistical Quality Control

The McGraw-Hill Book Company has recently isued a new book on Statistical Quality Control, by Eugene L. Grant, Professor of Economics of Engineering, Stanford University. (563 pp. 6x9).

This is a working manual whose object is to explain simple but important statistical techniques that can be widely used in industry to reduce costs and improve product quality. No attempt is made to write for the professional mathematician and statistician. The aim is to give just enough theory to supply practical working rules that will enable one to recognize the limitations of the methods as well as their many uses. Considerable attention is given to the Shewhart control chart for variables.

It appears inevitable that at some future date the technique of statistical quality control will become well known basic tols for use in all types of manufacturing. The Technical Association of the Pulp and Paper Industry recently established a committee to consider the application of these techniques to pulp and paper manufacture.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $5.00 per copy.

Electronic Theory of Acids and Bases

John Wiley & Sons, Inc. have recently published a new book entitled "The Electronic Theory of Acids and Bases," by W. F. Luder and Saverio Zuffanti, professors at Northeastern University, Boston, Mass. (165 pp. 5½ x 8½). This book presents in an elementary fashion the various aspects of the electronic theory.

This theory was first proposed in 1923 by G. N. Lewis. According to this theory acidity and basicity have nothing to do with the presence of any one element or group of elements. Acidity and basicity are relative terms indicating certain types of experimental behavior which may be exhibited by the vast majority of chemical compounds. This theory makes possible a great increase in the amount of correlation possible in all phases of chemistry.

Among the subjects covered are Atomic Orbitals and Valence; Electrophilic and Electrodotic Reagents; Acidic and Basic Radicals; Titration with Indicators; Displacement; and Catalysis.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry at $3.00 per copy.

Fuels and Fuel Burners

The McGraw-Hill Book Company has recently issued "Fuels and Fuel Burners," by Kalman Steiner, fuel engineer for C. Hoffberger Company, Baltimore, Md. (394 pp. 8½ x 5¼). This is a comprehensive treatment of the properties of fuels from the viewpoint of domestic and commercial heating, and the design, construction, installation, and operation of stokers, oil burners, and gas burners in moderate sized steam plants. A feature of the book is a rather complete discussion of automatic control methods and apparatus for heating systems, including the conventional electrical type and the more recent electronic developments.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $4.50 per copy.

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Annual Report of the Secretary for 1946

By R. G. Macdonald, Secretary-Treasurer, Technical Association of the Pulp and Paper Industry

The Technical Association of the Pulp and Paper Industry in 1946 benefitted to a considerable extent in its first full peacetime year since the war ended. There was a marked increase in membership, meetings and services. However these gains were made in the face of difficulties. Hotel accommodations were generally inadequate to meet the demands, and printing plant inadequacies held up the issue of nearly all publications longer than in any previous year.

Membership

In addition to an abnormal membership increase the return of former members from the armed services was considerable.

There were 582 individual members elected in 1946, 89 members resigned or were dropped. On December 31, 1946, the total individual membership was 2768.

There were 22 corporate and 16 sustaining members elected. 3 corporate and 2 sustaining members resigned. The corporate membership on December 31, 1946 was 172, and the sustaining membership was 158.

The following companies became corporate members in 1946:

A/B Centrallaboratorium-Keskuslaboratoria O/Y (Reinstated) Helsingfors, Finland.

Aero Research Ltd., Duxford, Cambridge, England.

Ben Mont Papers, Inc., Bennington, Vermont.

Bloedel, Stewart & Welch, Ltd., 904 Standard Bank Building, Vancouver, B. C., Canada.

R. A. Brand & Co. Ltd., Holland St., Pendleton, Manchester, England.

British Paper & Bd. Ind. Res. Assn. 1 Buckingham Palace Road, London, S. W. 1, England.

Clifton Paper Board Co. Inc., 1 Ackerman Ave., Clifton, N. J.

De Forenede Papierfabrikker (Reinstated) Naestved, Denmark.

Fourdrinier Kraft Board Institute, Inc. 475 Fifth Ave. Room 1604, New York 17, N. Y.

Gould Paper Co., Lyons Falls, N. Y.

Lawless Bros. Paper Mills, Inc. E. Rochester, N. Y.

Mo & Domsjo A/B, Ornskoldsvik, Sweden.

Oulu Osakiyhtio, Oulu, Finland.

Pamer Papelera Mercedes, S. A. Montevideo, Uruguay.

Paperteries de Belgique S. A. Service D'Etudes Et de Recherches, Duffel, Belgique.

Rogers Corporation, Manchester, Conn.

Shree Gopal Paper Mills Ltd., 5 Royal Exchange Place, Calcutta, India.

Societe Anonyme des Papeteries Darblay, 27 Rue des Pyramides, Paris, Ler, France.

Societe Des Papeteries Aubry (Reinstated) Croisset Les Rouen, France.

Union des Papeteries, La Hulpe, Belgium.

Vita Mayer & Co., Monte Napoleone 9, Milano, Italy.

Ward Paper Co., Merrill, Wisconsin.

The following companies became sustaining members in 1946:

American Bitumuls Co., 641 Judson Ave., Evanston, Ill.

American Defibrator, Inc. 405 Lexington Ave., New York, N. Y.

Armstrong Machine Works, 816 Maple St., Three Rivers, Mich.

John W. Bolton & Sons, Inc., Lawrence, Mass.

Buckman Laboratories, Memphis 8, Tenn.

Davidson Publishing Co., 22 E. Huron St., Chicago 11, Ill.

Diamond Alkali Co., 535 Smithfield St., Pittsburgh 22, Pa.

Gates Engineering Co., New Castle Road, New Castle, Del.

General American Transportation Corp., 10 E. 49th St., New York, N. Y.

The Huffman-Wolfe Co., 308 Standard Building, Atlanta, Ga.

Lodding Engineering Corp., Worcester, Mass.

Magnus Metal Corp., Garwood, N. J.

Left: R. G. Macdonald

Right: W. E. Brawn, *vice-president*

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And for *complete* insurance of clean-cut performance, this edge is delivered to you just the way the inspector okayed it . . . packed in wood so the edge literally "floats in air", beyond all danger of damage in transit.

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BRANCH OFFICES: 1330 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 416 W. Eighth St., Los Angeles 14, Calif.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Avenue, Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Washington. **Canadian Factory:** 595 St. Remi St., Montreal 30, Que.

Merritt-Chapman & Scott Corp., 17 Battery Place, New York, N. Y.

Paper & Paper Products (Walden Sons & Mott, Inc.) 41 Park Row, New York, N. Y.

A. O. Smith Corp., P. O. Box 584, Milwaukee 1, Wis.

Zaremba Company, 506 Crosby Bldg., Buffalo, 2, N. Y.

Corporate members that have joined the association since January 1947 include:

Compania de Celulosa de Filipinas (Reinstated) Bais, Central Negros Oriental, P. I.

L. Lacroix Fils, Paris, France.

John Strange Paper Co., Menasha, Wis.

United Paperboard Co., New York City.

Sustaining members that have joined the association since 1947 include:

Art Color Printing Co., Dunellen, N. J.

Brown Instrument Co., Philadelphia, Pa.

Traylor Engr. & Mfg. Co., Allentown, Pa.

Necrology

The association lost through death the following members:

Adamson, William, Chas. Walmsley Bury Ltd.

Allen, Arthur F., International Paper Co.

Blackhall, W. L., City of New York.

Bolton, Wm. W., John W. Bolton & Sons.

Burgess, Kenneth E., Magnetic Pigment Div. Columbian Carbon Co.

Burningham, F. A., Institute of Paper Chemistry.

Carroll, John F., Retired.

Daines, L. A., Heppenstall Co.

Glenn, Harry W., Crown Zellerbach Corp.

Haynes, Edward A., Port Huron Sulphite & Paper Co.

Hammarlund, H. L., Hamersley Mfg. Co. (Died in 1945).

Hawley, J. B., Hawley Products Co.

Hughes, Gordon W., Inland Lime & Stone Co.

Kirby, Verne E., St. Mary's Kraft Co.

Prather, Graham P., Consultant.

Reed, Edward O., Crane & Co.

Weiss, Orin A., Consultant.

Wickham, Almeron W., Retired.

Williams, Frank M., Williams Apparatus Co.

A routine activity of the central office throughout the year is the handling of manufacturing problem inquiries. This activity is of considerable proportion. A large percentage of these are quickly handled by the association staff with the information that is readily available. In addition to this some inquiries call for association surveys to obtain data and advice from a large number of qualified members. Frequently, committees conduct surveys and investigations. The responses to some of these are compiled in the form of Special Reports on Manufacturing Problems. In 1946 the following reports were issued:

363 Process Water Used in the Manufacture of Kraft Paper.
364 Paper Coating Patents.
365 Kraft Digesters and Cooking Conditions.
366 Groundwood Mill Equipment Survey—Section 1—Grinder Room.
367 Recording Meters for Black Liquor.
368 Sulphite Pulping Equipment.
369 Roof Sheathing over Paper Machines.

Employment

The association has conducted an employment service, without charge to anyone, for several years. It is desirable for any manufacturer who is seeking the services of technically trained men for positions as chemists, engineers, superintendents and management executives to request assistance from the Association's Secretary who maintains a file of available qualified individuals who have indicated a desire to obtain a position. This service operates on a strictly confidential basis. During the past year the association has been able to place a large number of individuals, many of whom were veterans discharged from the Army and Navy.

Fall and Special Meetings

The difficulty in obtaining adequate hotel accommodations gave the association an opportunity to experiment with a new convention service, namely, that of conducting three fall meetings of specialized interest that were attractive to certain specialists. Although the scope of each meeting was limited, there was as much time devoted to each as would normally have been devoted to a general fall meeting.

On September 25-27, 1946, a conference was held

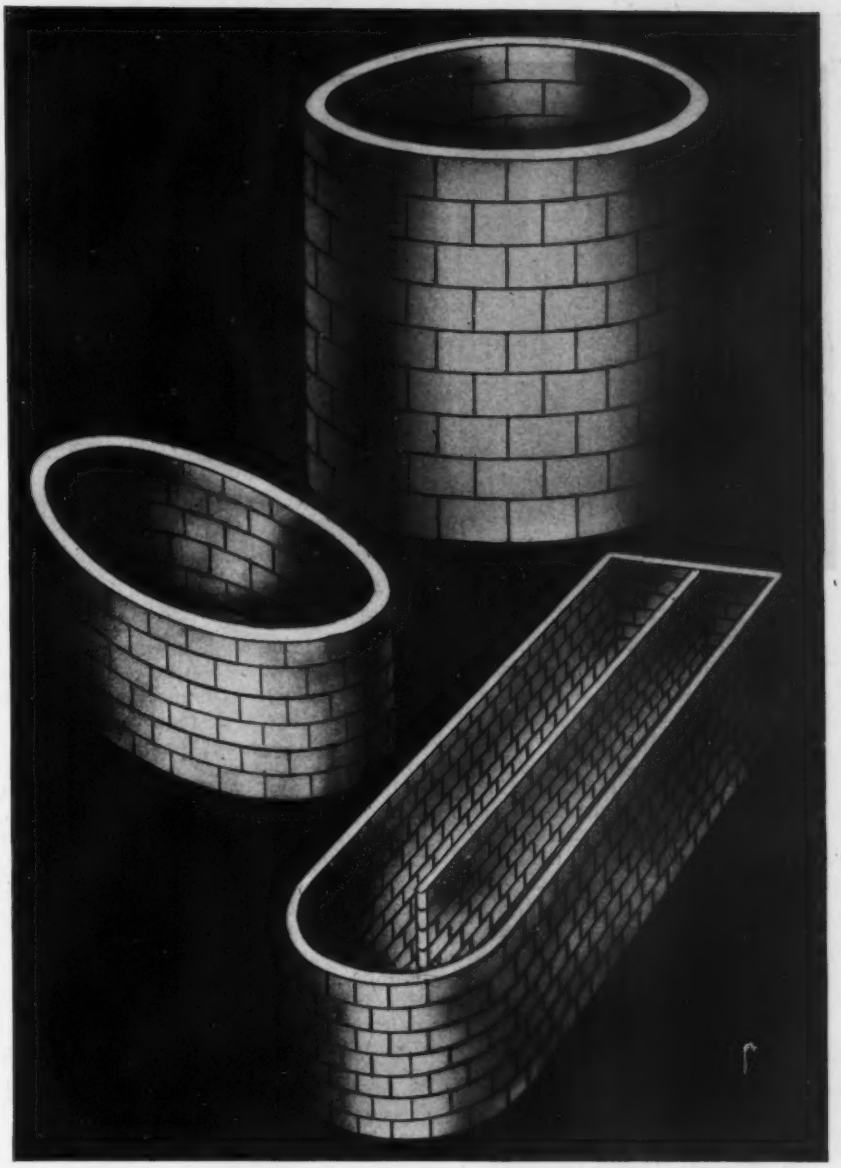
George J. Brabender

J. W. Hemphill

Pierre Drewson

Members of TAPPI Executive Committee

ANY SIZE *or* SHAPE *of* PAPER MILL TANK *or* CHEST *can be built with*



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Kalamazoo, Michigan : U.S.A.

K. P. Geohegan

W. F. Gillespie

William R. Barbour

Members of TAPPI Executive Committee

at the Statler Hotel and the Rackham Memorial Educational Building in Detroit, Mich., devoted to a thorough survey of the pulpwood stands inventory and consideration of their prospects for utilization. This meeting was attractive to company management and foresters. About 250 attended. Harry F. Lewis of the Institute of Paper Chemistry organized the program. The importance of the information brought together for presentation was considered great enough to justify the publication of a monograph containing the data presented.

On October 2-4, 1946 the association conducted its first engineering conference which was held at the Pfister Hotel, Milwaukee, Wis. Although this meeting, like the others, was open to all interested, a special effort was made through invitation to mill management to have mill power, maintenance, and construction engineers attend. This resulted in an unusually fine atendance of about 250 plant engineers who represented a major part of the industry's production. An excellent program was provided by the Association's Engineering Division, E. F. Burns, International Paper Company, Chairman. A fine program of industrial plant visits was provided by the Hummel & Downing Company, Allis-Chalmers Mfg. Company, and the Beloit Iron Works. R. K. Prince of the Allis-Chalmers Mfg. Company tendered useful services as chairman of the local committee.

On October 14-16, 1946, the Alkaline Pulping and Chemical Products Committees sponsored a meeting at the Roosevelt Hotel, New Orleans, La. About 250 attended. W. F. Gillespie, Gaylord Container Corporation, K. G. Chesley, Crossett Lumber Company, and R. H. Stevens, National Container Corporation and their committeemen organized the program. The Gaylord Container Corporation, Bogalusa, La., Vertrees Young, Vice President, acted as host and extended fine courtesies, including a visit to the mill and its woodlands.

This was the second conference sponsored by these two committees, the first being held in Savannah in 1944. Other conferences are expected to follow with the 1947 meeting tentatively being scheduled to be held in Asheville, N. C. The value of these special conferences was evident in the number of men, particularly in the operating departments of the mills who were able to attend and who would probably have been unable to atend a more general conference in a less convenient location.

On April 26 the Fibrous Agricultural Residues Committee conducted a conference at the Northern Regional Research Laboratory at Peoria, Ill. S. I. Aronovsky, chairman of the committee organized and presided over the program. About 50 attended. This was the second conference sponsored by this committee at Peoria and will probably be followed by others. Since this committee serves the strawboard mills of the middle west the conference has been particularly valuable in providing for the convenience of those served by it. Nearly all companies utilizing straw were represented, in some cases by their executives. The committee through its conferences is rendering a much needed technical service to a branch of the industry that has problems dissimilar in many respects to other branches of the industry.

Research Promotion

One major request for association funds was made by the Drying and Ventilating Committee, A. E. Montgomery, J. O. Ross Engineering Company, Chairman. This request was approved by the Executive Committee and provided for the financing of the expenses of a field engineer, E. L. Sawyer who visited several representative paper mills and conducted tests that revealed the drying rate characteristics of machines making certain standard grades of paper and paperboard. The data gathered was needed to provide factual information to complete the study of paper drying rates by the committee. The committee has published several reports on theoretical drying rates and required experiemental evidence to complete its investigation. The results of this investigation as well as previous studies will eventually be published in an association monograph. Mr. Sawyer was recently an officer in the Chemical Warfare Service and was formerly an engineer employed by the Brunswick Pulp and Paper Company.

Publications

A large proportion of the association's funds are

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used for the printing and dissemination of technical information in various forms. During 1946 these services weer increased at considerably higher printing costs than in previous years and under the impact of great difficulties due to labor shortages in the several printing plants used by the association. It is regretted that because of these problems great delays were encountered in having some of the assocoation's major publications issued on scheduled dates.

Technical Association Papers

Because of its size the issuance of Technical Association Papers was delayed by several months. Since it, like some of the other association publications are annual, their attention on the part of the printers suffers somewhat because of the necessity to meet the deadlines of periodicals. It is hoped that this unfortunate situation will improve during the coming years. The 1946 volume of Technical Association Papers contains 824 pages which is one of the largest to be issued by the association. It contains the papers presented at the 1946 annual meeting which was the largest from the standpoint of attendance and the number of papers presented ever conducted by the association.

The Paper Trade Journal continued to publish the major portion of the papers prepared for the association. All issues of this weekly appeared on schedule time. The association purchases a subscription to this magazine for each of its members and receives a compensation from the Lockwood Trade Journal for the editorial services performed by the Association staff. Beginning in 1947 it will be necessary for the association to pay an additional dollar for each member's subscription although there will be no increase in the rate of payment on the part of the Trade Journal for the editorial services that it receives. This imposes a financial burden on the association of a considerable amount that may make it necessary to revise some of the association's publishing services. This problem is being studied by a subcommittee of the Executive Committee. For the present the Executive Committee intends to retain the present membership dues even though it may be necessary to draw upon the surplus funds of the association. There is no other professional society of comparable size that renders the amount of publication services to its members as the Technical Association. It has constantly been the effort on the part of the association to extend its possible services. The elimination of frills and nonessentials has made these extensive services possible in the past.

The Bibliography of Papermaking and U. S. Patents

The Bibliography of Papermaking and U. S. Patents issued annually was not published in 1946. Instead an effort was made by C. J. West of the Institute of Paper Chemistry to prepare a collective bibliography covering the years 1936-1945. The 1946 annual bibliography will contain the patents issued in the United States in 1944 and 1945. The preparation of the collective bibliography represented a tremendou effort on the part of Dr. West and required more time than was originally anticipated. Printing plant difficulties also accounted for delay in publishing. As a result this volume was delayed beyond the end of 1946. As a permanent record its value cannot be measured. The association is indeed fortunate in having the interest and industry of Dr. West in doing this important work.

Standard Testing Methods.

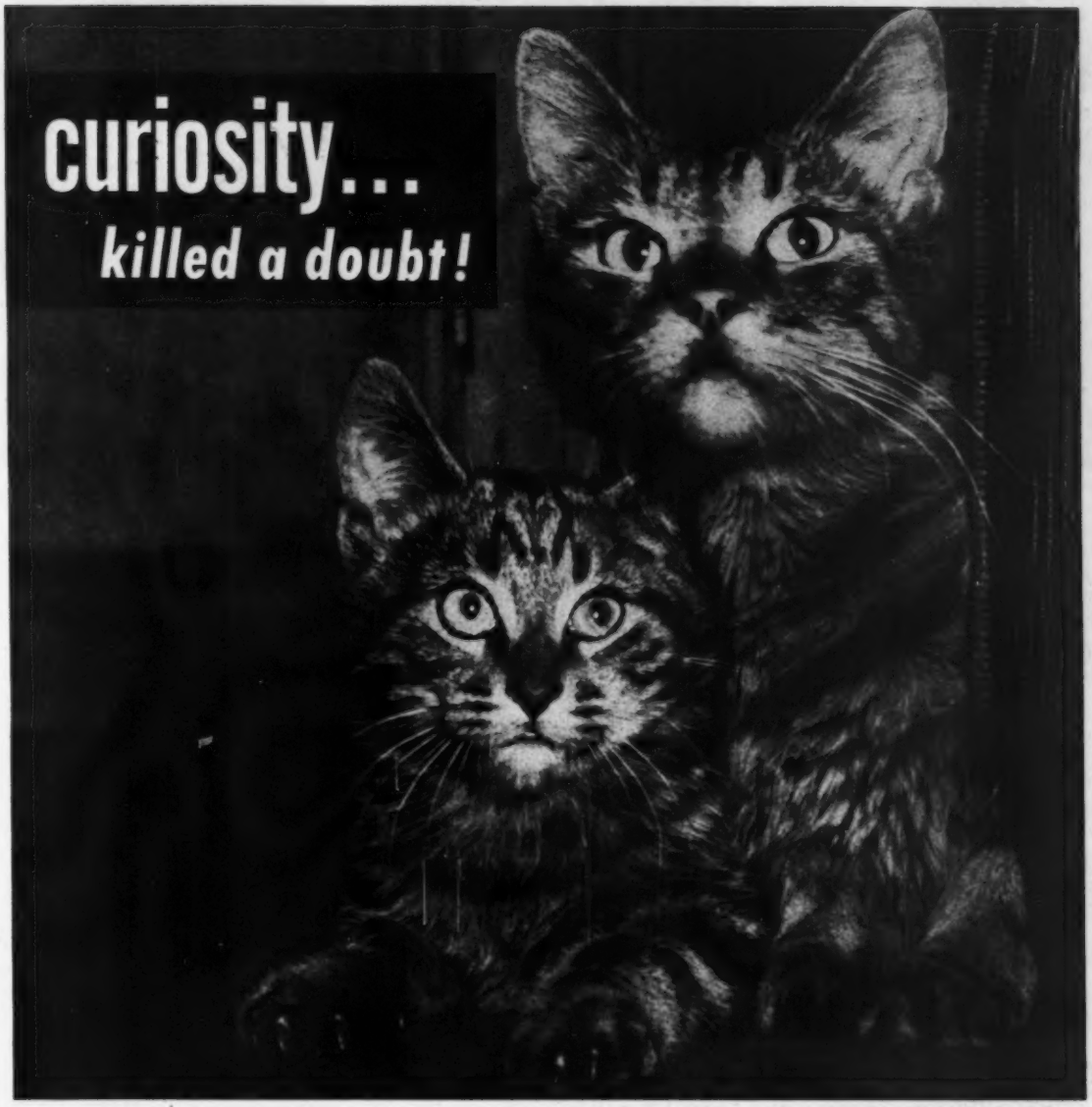
Thirty-three standard testing methods were issued in loose-leaf form in 1946. During the year requests were received from the principal standardizing bodies in Czechoslovakia, Uruguay, and Argentina for complete set of the TAPPI Standards. Arrangements were also made with the Technical Section of the Papermakers' Association of Great Britain and Ireland and the Technical Section of the Canadian Pulp and Paper Association wherein official committees of TAPPI and these organizations will attempt to coordinate insofar as possible their testing methods development. This will be accomplished in an informal way by exchanging new and revised methods for review and criticism prior to their adoption by the society initiating such methods. None of the organizations are committed to withhold adoption of methods because of the action of any of the other organizations. The Executive Committee approved a request by the Joint Army and Navy Packaging Board to reproduce such TAPPI Standards as are

F. W. Brainerd

James A. Wise

Edwin F. Burns

Members of TAPPI Executive Committee



MANY manufacturers of fine cotton content paper were doubtful but curious when they first tried Rayco Linter Cotton as a furnish. It was only after successful in-the-mill runs proved that it was an ideal base material, easily adaptable to a variety of processes and types of equipment that they recognized the importance of this Rayco engineered contribution to the supply shortage.

They learned from experience, too, that Rayco Linter Cotton was always delivered clean, ready for the cooker operation, and that it speeded production by eliminating rag room operations and reducing cooking time.

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Members of TAPPI Executive Committee

referred to in Government specifications. This procedure is necessary since the government is required to supply contractors with all testing methods referred to in the specifications.

TAPPI Data Sheets

A number of new engineering data sheets were prepared in 1946 but probably will not be issued until 1947. A unique feature of the 1946 issue will be a tabulation of the various dyestuffs used by the industry, giving their international index numbers which serve somewhat as common denominators that identify a dye of one manufacturer with a corresponding one under a different trade name supplied by another dye company. The color index is used extensively in the textile industry, but to a relatively small variety of colors used by the latter. Members are urged to supply material or make suggestions relative to future issues of the data sheets. This material should not be standard data found in the usual engineering handbooks but should refer primarily to the pulp and paper industry.

TAPPI Bulletin

The TAPPI Bulletin was issued on approximately a monthly basis and appears to meet a popular demand. Being limited to four pages per issue it requires but little time to read. Most issues contain a feature article which is written primarily for management and gives salient facts without too much technical detail. It also provides an opportunity to publish information that would normally not reach the notice of the average member. To some extent it has been used to keep readers informed concerning some of the association's major activities.

Monographs

One monograph "Starch for Paper Coating" was issued at the close of the year and one on Pulpwood; Stands, Procurements and Wood Utilization neared completion. The volume on Starch, Monograph No. 3 is the first of a series being prepared by the TAPPI Coating Committee under the chairmanship of Werner Kaufmann of Kupfer Bros. Company. It represents an unusually fine cooperative effort on the part of the paper coating mills and the starch manufacturers, the latter under the energetic leadership of J. G. Bullard of the Corn Products Refining Company. Chapters were written by highly qualified individuals and the entire material was critically reviewed by technical and operating men of most of the coating mills.

Pulp and Paper Manufacture

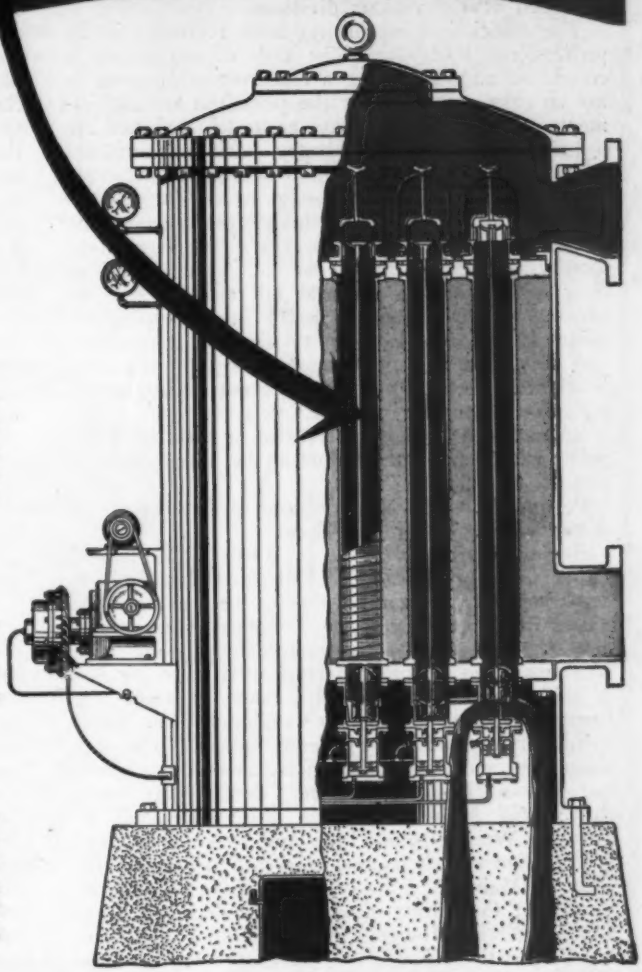
A new set of four volumes on pulp and paper manufacture is in preparation. Many members of the association are participating in writing their contents. Although it was hoped that these volumes would be ready in 1946 no effort was made to publish them before they could be authoritatively and adequately written. As a result the volumes when they appear will justify the patience of the editors and publishers because of their up-to-date character.

Local Sections

A charter was granted in the fall of 1946 to the TAPPI Chicago Section which was formerly known as the Chicago Professional Paper Group. This organization has had an unusually successful career due to the enthusiasm supplied by a large group of leaders. All of the sections returned to peacetime routine and held meetings on a regular periodical basis. The revival of activities by the Ohio Section was noteworthy. This section was particularly successful in arranging a series of meetings of a round-table nature in which a large proportion of its membership participated. The Pacific Section carried on a series of regional meetings that started in mid-afternoon and continued with a dinner and after-dinner speaker. The final meeting held at Gearhart, Oregon was attended by a very large group and featured the presentation of its now famous Shibley Award for the presentation of a superior paper by one of its younger members. The Empire State, New England, Maine-New Hampshire, Lake States, Kalamazoo Valley and Delaware Valley Sections all had fine progress throughout the year.

Chairmen of local sections elected during the past year include: *Pacific:* George H. Gallaway, Crown Zellerbach Corporation; *Lake States:* L. V. Forman, Institute of Paper Chemistry; *Delaware Valley:* John Macadam, National Vulcanized Fibre Company; *Kalamazoo Valley:* R. T. Mashburn, Hercules Powder Company; *New England:* L. B. Tucker,

ADAMS AUTOMATIC WATER FILTERS



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Crane & Company; *Ohio:* S. I. Olson, Champion Paper & Fibre Company; *Empire State:* John Campbell, Consulting Engineer; *Maine-New Hampshire:* E. L. Lamb, Oxford Paper Company, and *Chicago:* F. D. Long, Container Corporation of America. The Papermakers and Associates of Southern California (unaffiliated) John Van Ounsem, Pioneer Division, The Flintkote Company.

Divisions and Committees

Sixty-two committees and subcommittees in seven major divisions carried on the professional work of the association on a national scale. Chairmen were obtained for all committees and members of the Executive Committee were assigned to be general chairmen of the various divisions.

The association has always been fortunate in its professional leadership. The task of organizing a committee and developing a constructive program is not an easy one, but over the years the accomplishments of the committees have accurately reflected the technical advance of the industry. Each year finds the companies of the industry more willing to cooperate in revealing the progress being made. The accomplishment of the Alkaline Pulping Committee in this respect during the past few years has been noteworthy. The reports given at the meeting held at New Orleans during the past fall were such as to save nearly all companies in the kraft pulping industry large sums of money relative to the purchase and utilization of pulp washing equipment. The Southern mills were particularly generous in supplying information of real value. As a result all of the companies will be more successful in furnishing the public with a superior product at the lowest possible cost.

Personnel changes and additions to the committees in the various divisions follow:

Engineering Division: E. F. Burns, International Paper Company, General Chairman. This division was completely reorganized during the year and was successful in organizing the Technical Association's first Engineering Conference. Remarkably fine support was given to the attendance of a large number of mill engineers at the Milwaukee meeting. Mr. Burns succeeded W. G. MacNaughton of the News Print Service Bureau as general chairman. The new committees and their chairmen are as follows: *Steam and Power:* J. E. A. Warner, Robert Gair Company; *Mill Maintenance and Materials:* Paul F. Corning, West Virginia Pulp and Paper Company; *Mill Design and Economic Aspects:* Milton Jacobs, Chas. T. Main, Inc.; *Materials Handling:* George R. Wadleigh, Consulting Engineer; *Drying and Ventilating:* A. E. Montgomery, J. O. Ross Engineering Corporation; *Engineerig Research:* W. G. MacNaughton, News Print Service Bureau succeeded by J. B. Gough, Mead Corporation. Three other committees *Chemical Engineering, Water,* and *Mill Instrument Control* were originally assigned to this division but because of their broader interests were transferred to the Research Development and the Industrial Divisions.

Industrial Division: G. J. Brabender of the Marathon Corporation succeeded W. E. Brawn, Pejepscot Paper Company as general chairman, when Mr. Brawn became vice president of the association. The vice president is in charge of all division and committee activities. The *Industrial Engineering Committee* was discontinued and the *Water and Mill Instrument Control Committees* were transferred to this division from the Engineering Division. *Fibrous Raw Materials:* John Traquair, Mead Corporation; *Fibrous Agricultural Residues:* S. I. Aronovsky, Northern Regional Research Laboratory; (*Procurement, Storage and Preservation:* H. M. Blandin, Central Fibre Products Company; *Raw Materials Classification:* Dr. Aronovsky; *Pulping:* B. D. Stahl, Terre Haute Paper Company; *Board and Paper Manufacture:* M. F. Knack, River Raisin Paper Company; *Testing:* N. F. Wilson, Alton Boxboard Company); *Vocational Training:* B. E. Lauer, Univ. of Colorado; *Nonfibrous Raw Materials:* E. N. Poor, American Cyanamid Company; *Water:* L. B. Miller, Univ. of Cincinnati; and *Mill Instrument Control:* R. W. Porter, Chemical & Metallurgical Engineering.

Converting and Consuming Division: Pierre Drewsen, Consulting Engineer succeeded J. D. Malcolmson of the Robert Gair Company as general chairman. *Coating:* Werner Kaufman, Kupfer Bros. Company (*Adhesives:* Miss R. M. K. Cobb, Lowe Paper Company; *Defoaming Agents:* W. B. Morehouse, National Oil Products Company; *Mechanical Equipment:* F. W. Egan, Consulting Engineer; *Pigments:* W. F. Willets, Titanium Pigment Company; *Raw Stock:* W. A. Kirkpatrick, Allied Paper Mills; *Testing Procedures:* Miss Lois V. Hans, Hercules Powder Company; *Plastic Coatings:* S. S. Gutkin, Falk & Company and George Borden, Riegel Paper Corporation; and *Starch:* J. G. Bullard, Corn Products Refining Company: The Starch Subcommittee completed a monograph on Starch for Paper Coating which was published this year); *Containers:* W. B. Lincoln, Jr. of the Inland Container Company succeeded Arno W. Nickerson, Consulting Engineer; *Graphic Arts:* R. H. Simmons, Government Printing Office; The *Structural Fibrous Materials Committee* was transferred to the Pulping Division.

Research Development Division: F. W. Brainerd, General Chairman; *Abstracts and Bibliography:* C. J. West, Institute of Paper Chemistry; *Fundamental Research:* H. F. Lewis, Institute of Paper Chemistry; *Patents:* C. W. Rivise, Caesar & Rivise; *Bacterial Control Methods:* R. H. Torrey, Riegel Paper Corporation; *Plastics:* D. T. Jackson, Hammermill Paper Company acted as chairman during the temporary absence of E. C. Jahn, New York State College of Forestry who returned to the United States from Sweden in November and resumed the chairmanship. (*Wet Strength:* K. W. Britt, Scott Paper Company; *Resin Analysis:* T. A. Howells, Institute of Paper Chemistry). A new committee on *Statistics* was organized during the year. T. A. Pascoe of the Nekoosa-Edwards Paper Company became chairman. This committee will deal with the application of scentific statistical methods to the analysis of test data. The *Engineering Research Committee* was transferred to the Engineering Division and the *Chemical Engineering Committee,* R. P. Whitney, University of Maine was transferred to this division from the Engineering Division. This is a new committee and will study unit operations of chemical engineering as applied to process developments and plant equipment design.

Pulp Manufacture: W. F. Gillespie, Gaylord Container Corporation, General Chairman; *Acid Pulping:* G. H. McGregor, Minnesota & Ontario Paper Company; *Alkaline Pulping:* K. G. Chesley, Crossett Lumber Company; *Mechanical Pulping:* R. M. Drummond, International Paper Company; *Paper Deinking:* Frederic C. Clark, Consulting Engineer,

Murray PAPERMILL and WOODROOM Equipment

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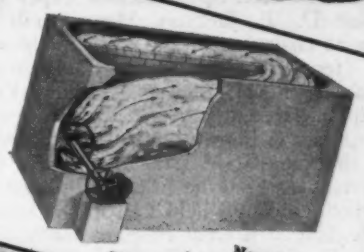
Here are some of the better-known Murray woodroom and papermill equipment items that for years have been serving the paper industry. Each machine has been improved as operating conditions demand more and more production, so that today they are machines designed and made to meet 1947 conditions. Complete details on any of the equipment shown here—or other woodroom or papermill equipment will be sent you upon request.



New Murco Axial Flow Agitator.

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KNOT DRILLS

CHIP CRUSHERS

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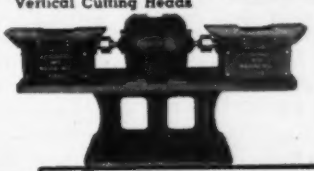
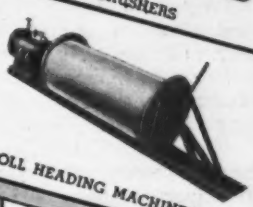
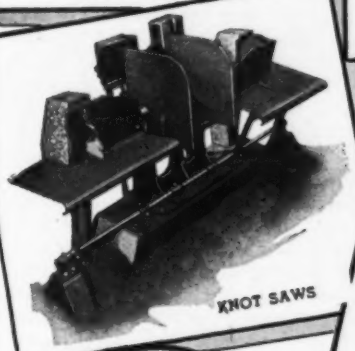


WOOD CLEANERS
Other models available with Vertical Cutting Heads

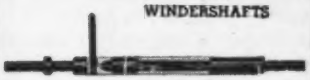
PULPWOOD CHIPPERS



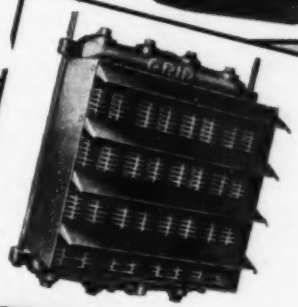
ROLL HEADING MACHINES



KNOT SAWS



WINDERSHAFTS



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High test cast iron heating sections — one piece construction; no soldered, brazed, welded or expanded connections — made to last longer than the other types of heating equipment.

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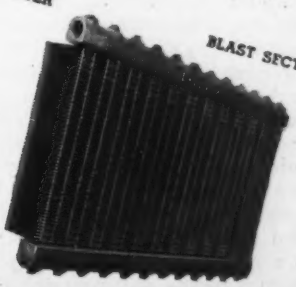
"fin" sections cast in one piece

UNIT HEATER

BLAST SECTIONS



MURCO QUICK OPENING GATE VALVE.

D. J. MURRAY MANUFACTURING CO.

WAUSAU WISCONSIN

W. D. Harrison of the Ecusta Paper Company succeeded D. T. Jackson, Hammermill Paper Company as chairman of the *Pulp Purification Committee* (formerly *Byproducts Committee*); *Chemical Products:* R. H. Stevens, National Container Corporation. (Recently W. P. Lawrence of the Champion Paper & Fibre Company succeeded Mr. Stevens as chairman). Messrs. Gillespie, Chesley, and Stevens organized the Alkaline Pulping and Chemical Products Meeting held at New Orleans in October 1946. The *Structural Fibrous Materials Committee:* John F. Campbell, Flintkote Company, Chairman, was transferred from the Converting and Consuming Division to this division during 1946. (*Raw Materials Testing Methods:* Glenn C. Kimble, Minnesota & Ontario Paper Company; and *Finished Insulating Board:* G. B. Brown, Johns-Manville Company).

Paper Manufacture Division: James A. Wise of the Kalamazoo Paper Company succeeded Pierre Drewsen, consulting engineer, as general chairman. *Papermaking:* A. E. Bachmann, Missisquoi Corporation (*Fourdrinier Machine:* B. L. Kassing, New York State College of Forestry; *Cylinder Machine:* O. E. S. Hedbring, United Paperboard Mills); *Preparation of Papermaking Materials:* P. P. Gooding, Strathmore Paper Company (Formerly *Preparation of Nonfibrous Materials Committee*). This committee also functioned as a committee of the New England Section.

Testing Division: James d'A. Clark, Consulting Engineer, General Chairman; *Fibrous Materials Testing:* E. R. Schafer, U. S. Forest Products Laboratory; *Pulp Testing:* L. V. Forman, Institute of Paper Chemistry; *Nonfibrous Materials Testing:* W. F. Hathaway, Kalamazoo Vegetable Parchment Company; *Chemical Methods:* J. C. Tongren, Hammermill Paper Company; *Microscopy:* Thomas Fyfe of the Eastman Kodak Company succeeded F. A. Burningham, Institute of Paper Chemistry (deceased); *Optical Properties:* A. H. Croup, Hammermill Paper Company; *Container Testing:* Don L. Quinn, Consulting Engineer. George R. Sears of the Institute of Paper Chemistry succeeded W. H. Graebner of the Marathon Corporation as chairman of the *Packaging Materials Testing Committee. Paper Testing:* B. W. Scribner, National Bureau of Standards (*Writing and Erasing Properties:* P. W. Codwise, Beaver Wood Fibre Company, Ltd.).

Special Committees: Joint Textbook: G. E. Williamson, Strathmore Paper Company; *Research Appropriations:* John L. Parsons, Hollingsworth & Whitney Company; *Standards:* R. C. Griffin, Arthur D. Little, Inc.

The accomplishments of the committees and divisions would extend this report to a very great length. They are itemized in detail in the TAPPI Year Book and Technical Association Papers. The Technical Association will continue to serve the pulp and paper industry well, as long as well qualified members are encouraged by their company managements to support and promote its committee activities. As opportunities for greater and better service becomes evident, ways and means will continue to be found to extend the services.

Kalamazoo TAPPI Discusses Water Reutilization

The Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry met at the Columbia Hotel, Kalamazoo, Mich., on Thursday evening, February 6th. About 65 attended.

The first speaker was C. E. Mueller, Bulkley Dunton Pulp Co., Inc., New York. His subject was "Description and Operation of the Sveen-Pederson Save-All." Mr. Mueller pointed out that the Sveen-Pederson save-all is a fiber recovery system which saves fiber and in no way affects the paper being produced. He described the system in some detail and pointed out that it consists of a method of adding a flocculent, either glue or silica sols, between the chest and the wire. This system permits the coagulation of small particles of filler and fiber so that the white water is materially cleaned and clarified. The white water is then used for process water (including showers).

The Sveen-Pederson save-all when operating properly produces a slurry of fiber and filler at a consistency of 2.0 to 2.5% and water which is clear enough so that it may be used almost anywhere on the machine, including felt showers.

Mr. Mueller pointed out that the Sveen-Pederson save-all is better than most other systems because of its quick action allowing efficient operation even with short runs and with changes in colors.

The savings which Mr. Mueller indicated were in: (a) filler and fiber; (b) heat — make-up water will be warm rather than cold and (c) faster permissible running time because the stock is warmer and drains and dries faster and (d) longer wire life.

The second talk of our meeting was given by Robert MacGonagle, Philadelphia Quartz Company. His subject was "The Preparation and Use of Activated Silica Sols in Paper Mills."

Mr. MacGonagle first discussed the mechanism of the behavior of an activated silica sol in paper mill white water. The types of sodium silicate and other chemical compounds which can be used in forming the sol were listed. A demonstration of the formation of a silica sol and its effect on river water was carried on during the presentation of the subject.

The advantages of the use of this system were given as clearing and purifying raw river water which is to be used in the manufacture of paper and the production of steam and making this water more suitable for those purposes.

A round table discussion followed the presentation of the papers by Mr. Mueller and Mr. MacGonagle. These topics were especially timely because of the fact that all of the mills in the Kalamazoo Valley are intensely interested in the stream pollution problem.

Those present included: Wm. G. Curry, A. E. Woollam, A. Lenderink, H. W. Wolters, N. McNaughton, Ray Barton, Paul Schreiber, Victor Burstein, Henry Nendorf, M. J. Roe, A. W. Cole, Arthur F. Bolles, J. I. Rhodes, S. I. Kukolich, R. T. Mashburn, F. R. MacGonagle, M. Gallbraith, M. Flotow, C. E. Gardner, Ralph Atkins, Clifford Beebe, Henry Reeves, Jr., W. F. Hathaway Hugh Smith, P. D. Carter, M. P. Wingate, D. R. Erickson, K. B. Latimer, Jim Verdon, Lee Mimms, M. S. Fogerty, F. L. Chappell, J. J. Harrison, K. L. Graf, D. D. Bachelder, E. H. Barnes, Jarvin C. Jones, C. L. Bachelder, C. C. Schneider, H. Berg, John Schneider, Percy C. Small, E. R. Haan, Fred J. Henning, Robert Buss, Al Sherwood, Howard Parker, George D. Gerpheide, J. W. Burke, C. T. Colgren, Myron Oliver, H. Merkle, Ray Newland, J. A. Heenan, J. Henshaw, P. W. Bartholomew, C. E. Mueller.

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Presentation of TAPPI Medal Award To Peter J. Massey

By Lyman Beeman

It is a great pleasure and a valued and appreciated privilege to be able today to present the TAPPI Medal Award, authorized by the Executive Committee of the Technical Association of the Pulp and Paper Industry to Peter J. Massey in special recognition of his achievements in contributing to technical progress in our industry.

The happiness and satisfaction I feel on the occasion of this award arises not only from my deep admiration and affection for the medalist, but also because of pride in long association with TAPPI and the work it has done and is doing. This fine organization has been a rallying ground and common center of activity for those interested in and working for the technical advance of our industry.

In retrospect, one looks back over an amazing change. Thirty odd years ago when this association was formed, pulp and paper making was a confused and unrelated mass of secret formulas, mysterious procedures, and selfishly and closely held know-how. Because of the work of the members and the light of knowledge and understanding they have thrown on these methods, we now see, however, a manufacturing technique based on scientific fact. Our ancient industry is emerging from the state of an art to one of a science.

Peter Massey's life of service to pulp and paper has covered the complete span of this change, and one might say his life of service has been symbolic of the change and development of manufacturing technology. He is one of a chosen few "practical" men who have become top technicians and who have shaped their practical approach to one based on scientific fact and knowledge. Many of the greatest advances have been made by these practical men who have learned to be technical men and through their knowledge of both aspects of manufacturing, have been able to serve to the fullest possible extent.

In 1912 Pete Massey was a press foreman at W. F. Hall Printing Company. He began to realize the importance of technical knowledge in printing and papermaking, and with his typical force and energy he set about to gain that knowledge by attending the night classes at Armour Institute of Technology. Over a period of six years, he completed a comprehensive series of courses in chemistry and engineering. It was logical for him to view this new knowledge from the standpoint of its practical usefulness, and no doubt here was the beginning of his down-to-earth approach to technical problems and his unusual ability to penetrate to the core of a situation. During this period, in which he rose to general managership of W. F. Hall Printing Company, he began to have many contacts with the paper industry, the first at Bryant Paper Company, as a critical, analytical, helpful customer. Some of his most important contributions to paper came through his recognition and analysis of the underlying causes for paper printing well or poorly.

I first knew him in 1919, or rather knew of him because I was working nights at the Kimberly plant of Kimberly-Clark Company. He was an enthusiastic customer and observer as this mill struggled to perfect the manufacture and control of its new groundwood printing paper. Since that year, he has been one of the great forces in developing the quality and extending the use of groundwood printing and converting papers and in this, his activities have covered a wide range in all three fields of paper, printing, and converting.

My first close contact and association with him was in 1929 when with George Seaman he took over the sale of the new groundwood printing grades then newly ready for the market at the Wisconsin Rapids mill of the Consolidated Water Power & Paper Company. Here his ideas of coating paper on the paper machine came to fruition, and in 1934 the first commercial machine coated papers were made at Wisconsin Rapids under the Massey patents. You are familiar with the tremendous success of these machine coated papers, but few of you are familiar with the fierce struggle to learn how to make them, to overcome the prejudice, to establish the technical procedure. One man, Pete Massey, waged this struggle and carried it through with a strength, tenacity, and resourcefulness few men are privileged to possess.

In 1936, he took over the management of Combined Locks Paper Company, then during the war years he acted as general manager of H. P. Smith Paper Company. In both of these locations, he applied and installed his methods of standardization and technical control. In the converting field, he turned his attention to the development of specialized packaging papers for Ordnance and other war uses and was outstanding in his contributions in writing specifications and developing papers to meet specialized war needs.

Last year he returned to an old friend, Bryant Paper Company, now a division of St. Regis Paper Company. In this present location as general manager, he is developing and advancing with his typical zeal and success.

In recognition of your brilliant and outstanding leadership, your vision and clear-sighted analysis, your energy, tenacity, and strength in always pushing toward the goal of achievement and contribution, and on behalf of the Technical Association I present you, Peter J. Massey, the TAPPI Medal Award. We extend you our most cordial congratulations and sincerest best wishes.

TAPPI Notes

Claud Christianson, formerly of the St. Regis Paper Company, is now pulp mill superintendent, St. Mary's Kraft Corporation, St. Marys, Ga.

Chris F. Bingham, formerly of the Virginia Smelting Company, is now vice president in charge of production of the Du Rite Company, Reading, Pa.

The TAPPI Kalamazoo Valley Section will meet on Thursday, March 6th at 6:30 p.m. at the Columbia Hotel, Kalamazoo, Mich.

Expression of Sincere Gratitude

By Peter J. Massey

Winner of TAPPI Award Medal

Response by Mr. Massey

When I received the letter from Mr. Macdonald advising that the Executive Committee of TAPPI had selected me as the recipient of this award, I experienced the greatest surprise and pleasure of my life, and that I was able to assimilate the shock bespeaks a fairly strong heart action. I am most deeply appreciative of the honor conferred upon me and wish to express my sincere gratitude to the members of the Executive Committee and the general membership of TAPPI for this medal.

I am particularly grateful to TAPPI for having selected me as the freshman in the ranks of the distinguished gentleman whom they have similarly honored in the past, and trust I will be able to measure up to the standards they have set for all of us.

I consider myself fortunate in having been associated with a number of the men whom you have previously honored, as they gave me the necessary fortitude when the going was tough. Mr. Everest, Mr. Mahler, and Dr. Kress were particularly helpful in pointing the way for a clearer concept when charting the road to any given end point. I believe that George W. Mead epitomized this thought with greatest clarity when he told me, "Peter, surround yourself with all the elements of success."

In my commonplace past, I have worked on one idea and ideal at a time and as thoroughly as I knew how to the limit of my capacity for analytical thought, I have endeavored to surround myself with the elements of success. The "elements" that have been of real importance are animate, not inanimate. It is the men with whom you work and associate that are the prime factors in any industrial achievement.

In the accomplishment of machine coating, such men as Burggraf, Collingnon, Strasser, Heinrichs, George, and Misegades, aided in the original heavy spade work to the point that George W. Mead, Theil, Berry, Dickerman, Raprager, Beeman, and others of my associates were able to supply the additional engineering knowledge for its successful consummation.

My first initiation into this industry was rather disappointing. I could see no romance in it from the worm's eye view I had in a board mill beater room. Therefore, I went over to printing, a craft which to me had lots of romance and opportunity. However, after making some headway and achieving an executive position, it became clear that what the craft needed most was technical knowledge of the raw materials and the physical phenomena involved in printing operations. Consequently, I went back to paper as that is the base upon which the edifice of the printed word is erected. The study of the relationship of paper to printing became my vocation and avocation, until it was acknowledged in the trade that while some of my crack-pot ideas were buncombe, some of them did work.

In December, 1912, I blossomed forth on my first trip to a paper mill as a so-called "expert." The mill was Bryant Paper Company. The job was to "get better printing values from their Bible paper." The man who had to do the job was "Daddy" Gilman. My only scientific implement was a linen tester. Somehow or other "Daddy" was touched and helped a poor boy trying to get along. The result was a very satisfactory printing sheet.

My next advent as an outside "expert" did not occur until 1917 when the trip to Bryant was repeated to cover the requirements of a 30-pound sheet for two-color rotary printing which was then in its infancy. Again, "Daddy" Gilman came through with the bacon. Subsequently, trips to mills became more frequent and I was in on the birth of many new printing sheets, including Mahler's bleached groundwood which I consider one of the important milestones in the industry's development. I was also in on the birth of the four-color process paper developed by my friends, Sunderland and Nevius.

Fortunately, I was with a company operated by men of vision which enabled me to institute the first technical control and printing paper testing laboratory in any printing plant in the United States with Roland Drake as chief chemist. The investment was very remunerative and was in a large measure responsible for the rapid growth and financial success of the company.

The studies and tests in this laboratory, plus the practical demonstration on the presses resulted in such revolutionary ideas as—groundwood and old paper stock papers are betters printers than "free sheets" . . . The purer the cellulose, the most difficult it is to print . . . The ideal printing surface was not cellulose but mineral . . . Coated paper using groundwood raw stock was superior in printing properties to raw stock free of groundwood . . . That phloroglucine was not a test indicative of quality in a printing sheet.

At the time of my first "technical" visit to a paper mill, TAPPI had not yet been born. Nevertheless, some of the leaders of the industry saw the need of better control of mill operations, and, when TAPPI was founded a few years later, the industry for the most part was ready to accept it. With the founding of TAPPI, came technical control and scientific knowledge of our industry, the cumulative results of which furnished the necessary impetus to achieve the progress we are enjoying today.

The job which TAPPI has done in the intervening years has been little short of miraculous. The contributions to its literature by its members and friends alone constitute a monument to the building of an art or craft to a mass production industry of tremendous proportions (about twenty million tons annually). The cumulative efforts of TAPPI's work for the past few years will be of even greater value to the Industry than its past contributions, and I am very proud to be a member of this institution.

Ohio TAPPI Discusses Starch

The February meeting or the Ohio Section of the Technical Association of the Pulp and Paper Industry was held at the Hotel Manchester, Middletown, Ohio, on Tuesday evening, February 4th, 1947. Because of the bad weather only 49 members were present.

The meeting was called to order by the new chairman, D. M. Yost of the Sorg Paper Company after which Douglas Marsh of the Champion Paper and Fibre Company opened the evening's discussion of the subject "What the War Has Taught Us About Starch."

Mr. Marsh discussed the various starches which they had used during the war for tub sizing. He pointed out that at the beginning of the war they considered enzyme converted pearl starch to be the most desirable starch for tub sizing when both cost and performance was considered. They tried many substitutes during the war and found them all usable if you were desperate enough for tub sizing starch. However, after all of them had been tried, they still considered pearl starch to be the best.

Of the various substitutes which they have tried he considered potato starch to be the best. Except, from the performance angle, the potato starch was fully as good or better than the pearl but the cost was quite high.

The dextrinized or chlorinated starches which are sold for tub sizing purposes were also found to be quite satisfactory. However, since the supply of these materials was short, what they were able to obtain was diverted to other uses such as coating and little was used for tubsizing.

All the other materials tried as substitutes contained substances which would gradually settle out in the tub causing a build up in viscosity. This would eventually reach the point where it would be necessary to dump all the starch in the tub, with the resulting loss of good starch. It was also found that most of the substitutes were harder to wet than pearl starch. Enzymes were always used for converting the starch substitutes.

Of the remaining substitutes Victory Colodite was considered to be the best. It is a modified wheat or rye which gave some build up in the tub but the build up was not bad. However, the strength obtained from it seemed to be lower than that obtained from pearl starch.

Rye flour was considered usable if a person was desperate enough for tub sizing materials. However, it contained 30% or more non-starchy material and, to use it, it is necessary to blend it with better grades of starch. Since it contained so much non-starchy material the build up was very bad.

W-100 which is a modified wheat was found to have good strength but it also had a very rapid build up making it necessary to blend it with other materials.

A. G. Corn was also used and was found to have a build up in the tub. Little further comment was made on this grade.

Soy-bean flour was found to be the poorest of all the substitutes tried. It contained about 50% protein and the build up was so bad that the tub had to be emptied every six to eight hours.

The next speaker was Don Goodman of the Sorg Paper Company who opened his discussion with a general review of tub sizing materials that had been used and pointed out that before the war many people were depending upon tapioca starch for enzyme conversion. The first enzymes used were not very satisfactory for corn starch since they were killed at such a low temperature that proper swelling of the starch granules and the resulting conversion had not taken place. He considered one of the most important contributions made during the war was the development of better enzymes for the conversion of corn starch since tapioca starch had become unobtainable.

Mr. Goodman pointed out that there were three actions which take place when starch is converted. First is the liquefying action which does not attack the molecule but attacks the granule making them easier to disperse. Second is a dextrinizing action which splits the molecule into shorter chains. The third is a saccharizing action in which the starch is converted into sugar. It is desirable to avoid the last two of these actions as much as possible.

It was pointed out that enzyme converting gives a mixture of large and small particles while chlorination gives particles all more nearly the same size. It was also found that some of the granules were never ruptured in enzyme conversion and for this reason the strength obtained from enzyme converted starch was usually not as great as that from chlorinated starch. If the starch is given a vigorous boil at the end of the cook, the particles will be better broken up and a starch of better strength will be obtained.

In order to get the starch particles better broken, Mr. Goodman considered vigorous mechanical agitation to be quite as important. In fact, some starch manufacturers have recommended that they use homogenizers. Such extreme agitation had never been resorted to, but they were working on an agitator of the type used in a hydropulper which would give agitation much greater than that used in the normal starch cooking tank.

After Mr. Goodman's talk the meeting was thrown open to remarks and questions from the floor. At this time Harold Harvey, of Pennick and Ford, made a few remarks about uses of starch in ways other than tub sizing. He pointed out that the demand on the starch manufactures had been tremendous and that it had been necessary to greatly expand their plants during the war. He also pointed out that they had developed many new uses for starches, and that although some of the substitutes had not proved as good as the pearl starch, knowledge which they had gained in making these substitutes would be quite valuable in giving the industry better starch.

A question was asked from the floor about the use of unconverted pearl starch in the tub. It was stated that unconverted pearl starch had been used in kraft paper for laying fuzz only. It had been cooked at a concentration of about 2% using 2% caustic and was then run in the size tub at a temperature of 140 to 150°F. It was pointed out that when using unconverted pearl starch there was selective absorption so that the water was removed faster than the starch causing the solution to thicken.

In reply to a question as to what could be expected from various starches it was stated that re-

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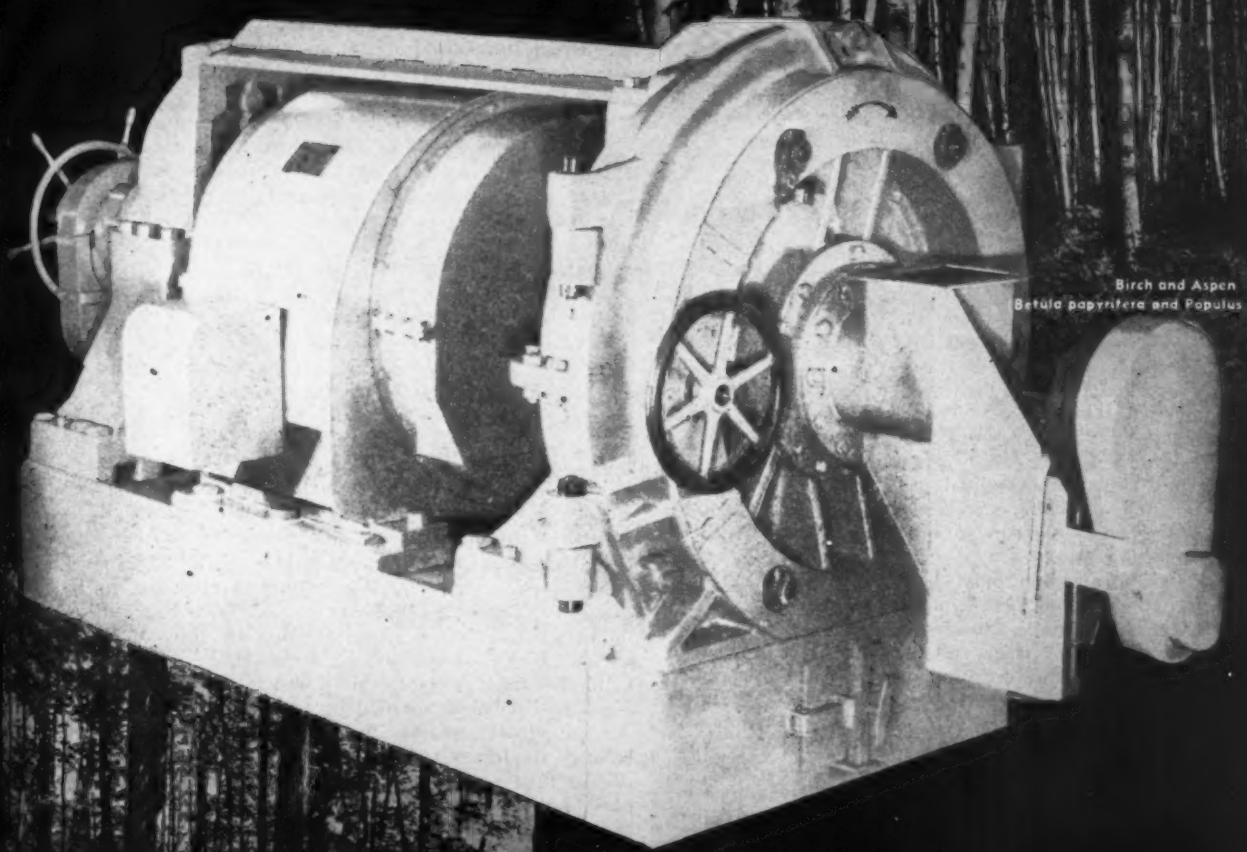

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gardless of type, if a uniformly dispersed starch was used and the same amount added to the sheet about the same strength pick up would be obtained. Although this was not completely true of printing qualities it was found that here too, the amount of starch added to the sheet seemed to be more important than the type of starch used.

The meeting was adjourned about 9:30. Those present included: John E. Burdsall, Douglas R. Marsh, Art Thurn, Glen Augspurger, D. M. Yost, C. E. Brandon, D. J. Goodman, S. A. Hluchan, Edward Lum, P. M. Schaffrath, E. A. Johnson, H. C. Koch, W. H. Cart, A. J. Etter, John Clouse, Robert Beckett, R. D. McCarron, H. B. Fuller Jr., T. L. Stirling, Walter J. Cassidy, P. S. Cade, Chester N. Stupp, Paul C. Miller, R. R. Weber, T. Agronin, F. C. Clark, C. E. Ahlm, S. R. Holmes, Art Coffin, M. G. Magnuson, M. C. Trempohl, H. W. Vanderberg, W. J. Carroll, Kon Matchuck, Carl D. Roess, Art Griffith, Harry C. Fisher, D. S. Brown, William Boast, C. R. Merriman, L. B. Miller, Harold Sinclair, Harold A. Harvey, Jerrold H. Moyer, F. H. Root.

Chicago TAPPI Discusses Paper Coating

The largest attendance of the 1946-47 season enjoyed the Chicago Section of the Technical Association of the Pulp and Paper Industry panel discussion on "Getting the Most Out of Coating Paper Surfaces," on Monday evening, January 20, at the Chicago Bar Association.

The participants in the discussion were John Hallauay, paper consultant; Wm. A. Kirkpatrick of the Allied Paper Mills; Frank Egan and Fred A. Weymouth, I.P.I., Division of Interchemical Corp.

Mr. Halladay debunked many erroneous impressions of paper coating processes. Many new methods have replaced old conventional processes. He illustrated his remarks with a series of interesting colored slides showing microphotographs of various types of coating on box board.

Mr. Kirkpatrick gave an interesting exposition of how coating on paper enhances the appearance of offset and gravure printing and improves the brilliance of inks in letterpress processes. He explained the extreme importance of careful inspection of coated papers to insure uniformity of surface and subsequent finished printing quality.

Mr. Egan gave a most instructive dissertation on the various types of machines used for coating paper surfaces. He explained the basic process and illustrated his talk with a graphic series of "chalk talks" depicting the principles of each basic process.

Mr. Weymouth presented the ink maker's viewpoint of the coated paper industry and explained why ink manufacturers preferred coated papers. He pointed out that coated papers were still in the experimental stages for rotogravure printing and also described the improvements being made in inks to be used on coated stocks.

Following these talks, a most lively and interesting question and answer session kept the speakers constantly on their feet. A full transcript of the four talks and the question period which followed has been prepared and is available. Copies may be obtained at a reasonable cost by writing Miss Tadla, c/o Container Corporation of America, 10 N. Clark Street, Chicago 2, Illinois.

The program committee of the Chicago Professional Paper Group has again planned another panel discussion program for the February meeting of the group, to be held on Monday, February 17. The subject will be "Printing Methods and Printing Machine Design." The participants in this panel will be Paul Twyman, assistant sales manager for the Miehle Printing Press & Mfg. Co.; Reynolds P. Perry, district manager of Harris-Seybold Company, and Leonard J. Remington, sales manager for Champlain Company, Inc.

Western New York TAPPI Discusses Pulp Measurement

The Western New York Group of the Empire State Section of TAPPI held their monthly meeting on Wednesday, February 12th, at the Prospect House, Niagara Falls, N. Y. John Campbell presided at the meeting in the absence of A. H. Nadelman. R. Rusch introduced the speaker, W. A. Diament, Vice-President of Fischer and Porter Co. of Hatboro, Pa.

Mr. Diament expressed the opinion that a high degree of understanding and sympathy would come about between his industry and the papermaking industry if measuring and proportioning problems of the industry are jointly discussed. He felt that the kind of equipment wanted would come forth.

He traced the development of the variable area flowmeter, known to the trade as the Rotameter and now called the Flowrator, from 1879, when George Joslyn first used a transparent tapered tube and float, through to present day models, which incorporate recording, controling and proportioning devices. Tapered tubes, pre-fabricated for easy installation between flanges of two standard pipe tees, measuring flows up to 15,000 GPM of liquid and 12,000 cfm of gas, were shown, together with special designs for handling very corrosive fluids and for pressures up to 6,000 lbs. per square inch.

Mr. Diament dwelt at some length on the development work which has been done to improve the float. A coloured motion picture was shown to demonstrate the flow pattern surrounding the float at various float contours and fluid viscosities. The float being of fixed weight, the pressure differential is equal to its weight divided by the area of the head. An increased flow rate instantaneously changes the balance of forces, producing an upward movement of the float to a point where greater annular area exists between the float head diameter and the inside diameter of the metering tube. The pressure differential being fixed, the area varies directly as the flow rate rather than the flow rate varying as the square root of the pressure differential. The float, when fabricated from materials of twice the gravity of the medium being metered, will read directly through a wide range of specific gravity in terms of weight units.

As an outgrowth of development work, Mr. Diament told the gathering of the viscosimeter, which employes two floats, one insensitive to and the other sensitive to viscosity change. By utilizing the insensitive float for maintenance of constant flow rate, a direct and instantaneous viscosity reading is obtained from the viscosity sensitive float.

The proportioning of sulphite stock to groundwood and subsequent proportioning of colour, alum, clay, slurry, etc. was thought to be a fertile field. Flowrators are in use in stock lines at consistencies of 3% for sulphite and 4% for groundwood. A list of applications in the paper industry was presented.

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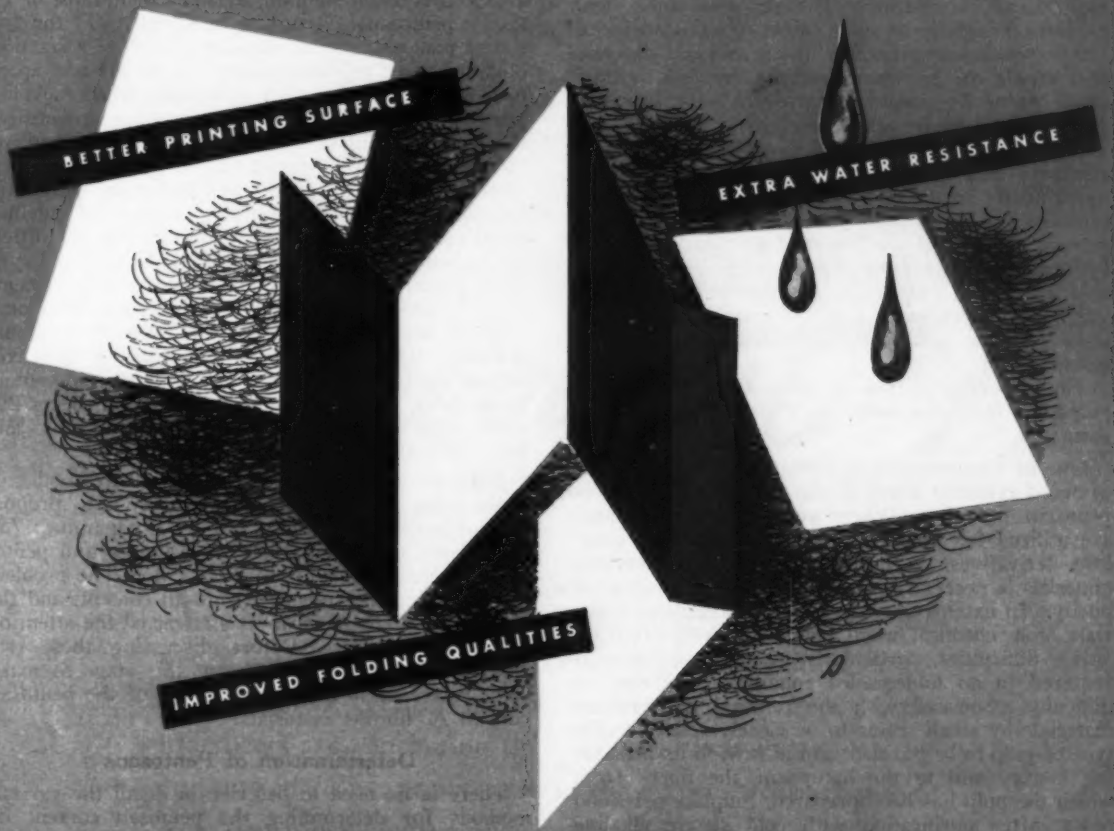

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P7-3

The Cold Alkaline Purification of Wood Cellulose*

I. Some Effects of Bleaching and Acid Hydrolysis on Resistant Pentosans

By Alexander Meller[1]

Abstract

The significance of resistant pentosans in wood pulps, and the nature of their association with cellulose, are outlined in the light of existing views.

The results are presented of experiments designed to increase the resistant pentosan fraction in softwood pulps by means of hydrochlorite bleaching (oxidation), and by acid hydrolysis.

Hydrolysis of prebleached wood pulps with acid solutions, and treatment of prebleached pulps with hypochlorite solutions, yielded products with similar viscosities in cuprammonium solution. A greater percentage of material was removed by cold 7% sodium hydroxide solution from the bleached than from the acid hydrolysed pulps. The bleached pulps contained less resistant-pentosans than the hydrolysed preparations for the same solution viscosity in cupremmonium.

The depolymerisation of carbohydrates in wood pulps and their dissolution by 7% alkali solution are discussed.

One of the principal objectives in the purification of wood cellulose fibers is the extensive removal of pentosan materials. When wood cellulose products are utilized for preparing certain high quality cellulose derivatives, a thorough removal of pentosan materials is necessary to satisfy the requirements for purity. An extensive removal of hemicellulosic materials from chemical wood pulps, however, often involves difficulties, particularly when the cellulose is required in an undegraded condition. The ease or difficulty associated with the removal of pentosan materials by alkali seems to be closely related to the type of pulp to be purified, and in turn to its processing history and to the nature of the fibers from which the pulp has been prepared. Sulphite softwood pulps, after purification with cold strong alkaline solutions, generally exhibit a greater purity than purified sulphite hardwood pulps, or purified soft- and hardwood pulps obtained by alkaline pulping methods *(1)*.

At relatively low temperatures (0 to 20°C.) sodium hydroxide solutions remove considerable quantities of hemicellulosic (pentosan) materials from wood pulps, without damaging the cellulose *(2)*. Based on the strength of the sodium hydroxide solution applied, Schmidt and collaborators *(3)* introduced the terms "easily soluble xylan" and "difficultly soluble xylan" to designate the pentosan fractions present in beechwood holocellulose. The former refers to a fraction of the pentosans soluble in 0.2%, and the latter to that in 5% cold sodium hydroxide solution. After extraction of beechwood holocellulose with these solutions, however, the residue was by no means free of pentosan materials *(4)*. Similarly, it is widely maintained that the alpha-cellulose fraction of wood pulps is not always free of pentosans *(5)*. Richter *(6)* refers to these pentosans, insoluble in 17.5% cold alkali solution, as alpha pentosans, or resistant pentosans. According to Klauditz *(7)* the "resistant pentosan" is the pentosan content of a fraction, obtained after repeated treatments of the test specimen with 7% cold sodium hydroxide solution. When purified hardwood cellulose preparations are utilized for making cellulose derivatives, the quantity of resistant pentosans appears to be of great importance. The quantities of total- and resistant pentosans tolerated and the alpha-cellulose content of purified wood cellulose specified vary considerably for different industrial cellulose derivatives. According to the same author, hardwood pulps meet the requirements of the viscose industry when they contain 8% total- and 1% resistant pentosans, and 89 to 91% alpha-cellulose. The requirements for making haze-free acetate solutions, cellulose ethers, and cuprammonium rayon from pulps are much more critical, being 2% total- and less than 0.2% resistant-pentosans, and 96 to 98% alpha-cellulose.

Sulphate wood pulps, particularly hardwood sulphate pulps seem to contain a relatively large proportion of resistant pentosans, or as Lindpaintner *(8)* formulates, the linkage between cellulose and pentosons is relatively strong in these pulps. The problem of decreasing the resistant pentosan content, and the elucidation of their nature has attracted the attention of several workers. Before discussing these two aspects, it appears opportune at this stage to make some reference to the determination of the pentosan content of fibrous materials.

Determination of Pentosans

There is no need to describe in detail the current methods for determining the pentosan content of cellulosic fibers, although it may be mentioned that the mechanism of the chemical reactions involved is not fully understood. It is widely held that in the customary distillation procedure, using 12% hydrochloric acid solution, pentosans yield furfural, some cellulose fractions yield hydroxymethyl furfural, while acid types of oxycellulose and some polyuronides also yield furfural. The percentage of these two volatile aldehydes recovered appears somewhat problematic, and the determination (separation) of the aledhydes individually in the condensate is rather difficult. The methods and improvements suggested were compiled recently by several authors in comprehensive surveys *(9)*. It should be noted that in determining the pentosan content of cellulosic materials containing a large quantity of this component, such as ordinary wood pulps, the difficulties listed above may not be important, because the greater part of the volatile materials liberated during the distillation with 12% hydrochloric acid will be furfural. The relatively smaller proportion of hydroxymethyl furfural arising from cellulose may not materially alter the results. With purified wood cellulose, how-

*Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

[1] Research Chemist, Australian Paper Manufacturers, Ltd., Melbourne, Victoria, Australia.

And that's just what Mr. and Mrs. America are doing, for never has there been such a demand for magazines, newspapers, books, catalogs, and advertising matter. Paper manufacturers are continuing their splendid wartime efforts by running at full capacity to meet the record-breaking peacetime demand for paper and paper products.

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ever, the quantity of hydroxymethyl furfural liberated from cellulose may be large in proportion to the furfural arising from pentosans. A correction for hydroxymethyl furfural in this case seems to be necessary, but the establishment of a universal correction factor, as proposed by several workers, is of doubtful validity. It is anticipated that the reactivity of the fibers will influence the rate of liberation of volatile aldehydes from cellulose and pentosans. It may be visualised that highly swollen fibers, containing a large portion of amorphous or easily accessible areas, when distilled with 12% hydrochloric acid solution for the customary (and constant) period, will yield more volatile aldehydes, than fibers with a very small internal surface or containing a large portion of dense crystalline building elements. This reactivity of the fibers is largely influenced in turn by the processing history of the fibers. Purified wood pulps, produced by the cold alkaline purification process, should contain a large quantity of highly swollen reactive cellulose, and this fraction may contribute to the difficulties of determining and interpreting the pentosan content of these fibers by the current methods.

Views on the Nature of Resistant Pentosans in Cellulosic Fibers

The difficulty of completely removing pentosans from cellulosic fibers, without seriously degrading the cellulose, together with the resistance which pentosans exert towards alkaline and acidic purifying solutions, led many investigators to the view that a linkage may exist between some of the pentosans and cellulose in fibers. The nature of this linkage, and the fine structure of the resistant pentosans, have been interpreted differently by various authors.

Schmidt and co-workers *(10)* believe that there is a stoichiometric relationship consisting of one glucose anhydride to three xylose anhydrides in the "difficulty soluble xylan fraction" in beechwood. They interpret the occurrence of this constant ratio to a chemical, ester like linkage of the two components. ("Ester Linkage Theory.") This view was strongly criticised by Lüdtke *(11)* and by Jayme *(12)* who could not find this ratio in other fibers, and it was shown that the fraction insoluble in 5% sodium hydroxide solution contained acid groups (polyuronides) and pentosans.

Voss and collaborators *(13)* ascribe the difficulties in the extensive extraction of pentosans from plant materials to the particular orientation of the fiber building units in the cell wall, conditioned by the morphology of the fibers. According to these workers the cellulose chains, in the form of bundles (micelles) are surrounded by a dense layer of xylan chains. This view was extended by Klauditz *(14)* and by Jayme *(15)* who suggest that on the surface of the cellulose crystallites, other polyoses, such as pentosans and mannan are embedded and strongly linked with the cellulose molecules. The exact nature of this linkage is not disclosed by these authors, but they presumably imply a primary valence linkage, since they state that these polyoses can be removed by acid hydrolysis. ("Theory of Particular Structure of Fiber Building Elements.")

Norman *(16)* advances the view that in cellulosic fibers there may be present mixed chains, that is, chains containing glucose, xylose, and uronic acid, units. The presence of such mixed chains might account for the extreme stability of a small portion of pentosans which resists extraction on boiling with

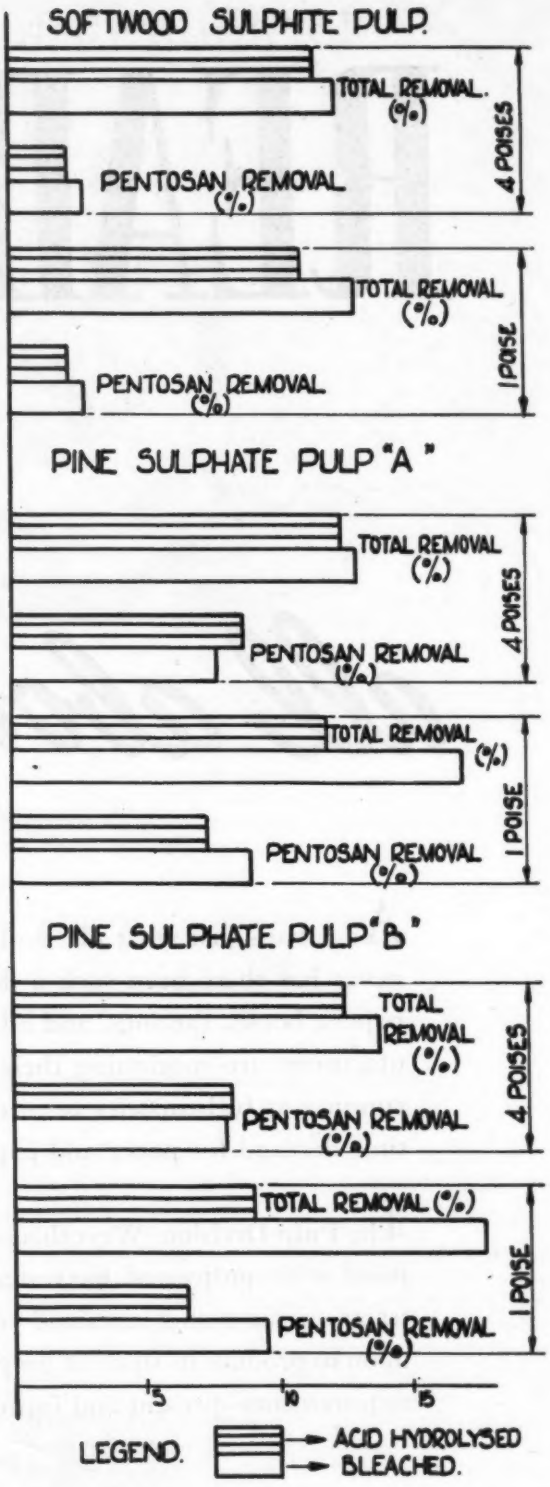
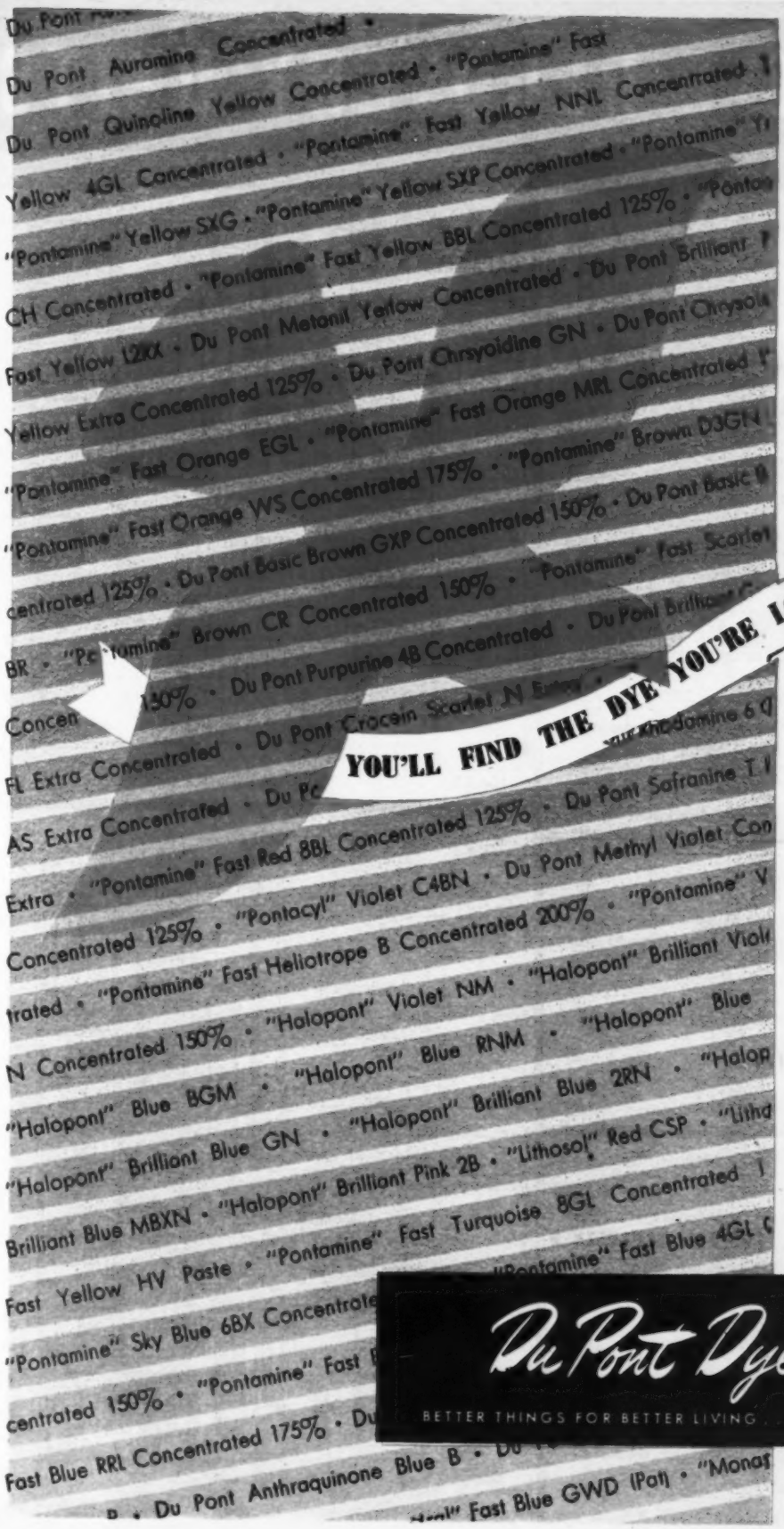


FIG. 1
Removal of Hemicellulosic Materials by Cold Strong Alkali Solution

relatively strong caustic soda solutions. ("Theory of Mixed Chains.")

A somewhat modified view, proposed by Astbury, Preston, and Norman *(17)*, formulates a secondary valence type of bonding between some of the pentosans and cellulose. According to these authors,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Brilliant Blue MBXN • "Haloponf" Brilliant Pink 2B • "Lithosol" Red CSP • "Litho
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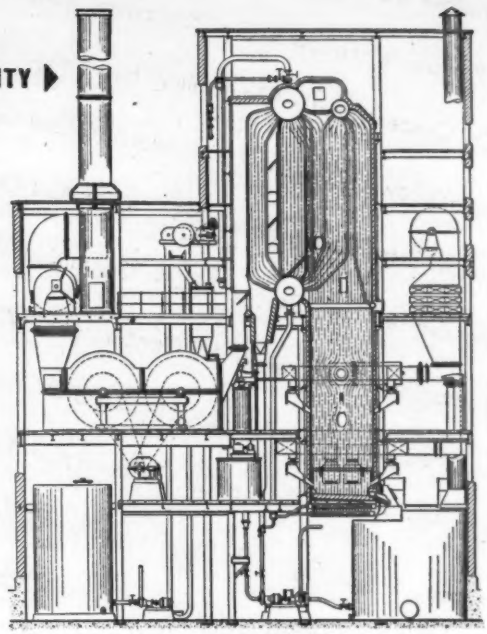

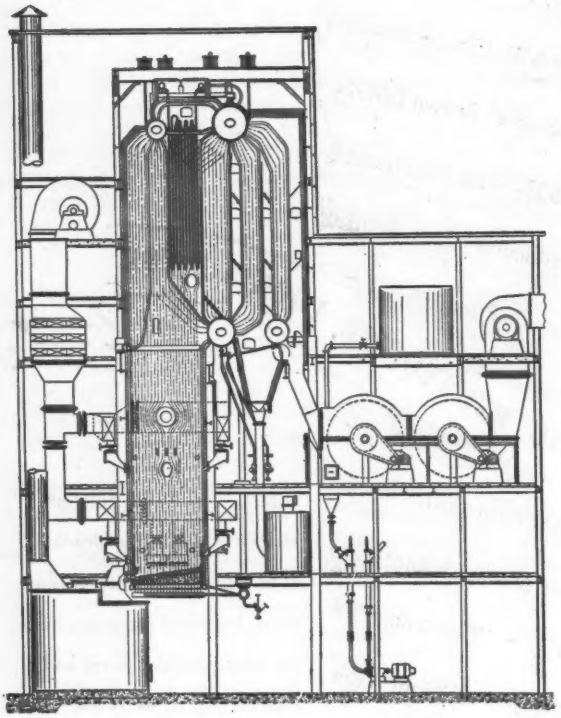

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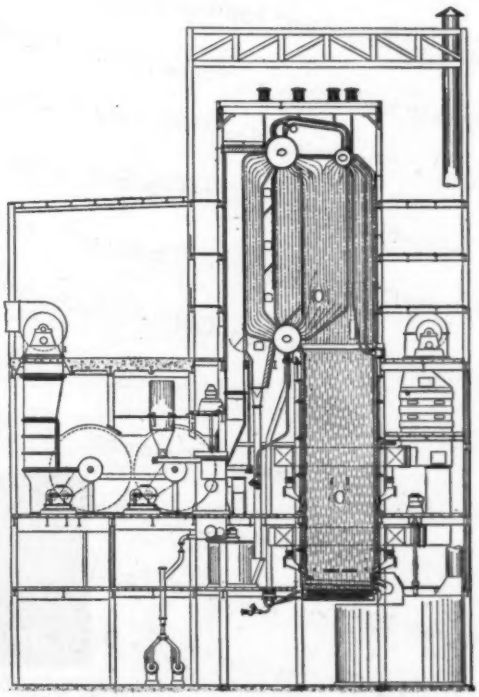

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this association is a special case of mixed crystallization, in that some pentosan chains together with cellulose chains participate in the formation of the micelles. Pentosan chains of this type would be retained by lateral forces in the oriented regions, similar to those which are operative between adjacent cellulose chains. ("Mixed Crystal Theory.")

The possibility of cross bridging between different chains was also advanced by Norman *(18)*. ("Theory of Cross Bridges.") Such cross bridging in the form of ether linkages between xylan chains in beechwood was envisaged by Husemann *(19)* who offered this view to explain the relatively low reducing power of xylan fractions in beechwood holocellulose. McKinney *(20)* maintains that "anhydro-hemicelluloses" which are very resistant to acid and to alkali, are formed during alkaline cooking of wood. The work of other investigators suggest that cross linkages may be formed during the drying of cellulosic materials *(21)*.

Meyer *(22)* refers to indications that some of the hydroxyl groups in native cellulose are masked, perhaps by forming esters with carboxyl groups of neighboring chains. He also points out that neither the x-ray nor the chemical analysis is perfect. The x-ray diagram shows only the presence of bundles of cellulose chains which may be linked chemically at their edges with substances such as xylan, other hemicelluloses or lignin. The chemical methods, according to Norman *(23)*, often do not reveal whether sugars and uronic acids obtained by hydrolysis were originally associated as units in the same molecule or in different chains. Meyer *(24)* does not exclude the possibility that polyuronic acids from a cement between the cellulose miscelles, chemically linked together around micelles, or surrounding groups of micelles.

According to Sisson *(25)*, it is conceivable that there is a sort of mixed crystallization of cellulose with noncellulosic materials at the surface of the crystallites. In his view, a secondary valence type of bonding may exist between cellulose and noncellulosic components in fibers.

Undoubtedly, a more exact knowledge of the structure of resistant pentosans, and of the nature of their association with cellulose in wood pulps, would be of great help in designing purification processes for the removal of pentosan materials from fibers. On the other hand, a better understanding of the nature of resistant pentosans may be gained by studying the colloidchemical and physical phenomena involved in the purification processes.

Experiments Designed to Decrease the Resistant Pentosan Content of Wood Pulps

As referred to above, several investigators have studied the influence of processing conditions on the removal of hemicellulosic materials from wood pulps by strong cold alkaline solutions, but little attention has been paid to decreasing the resistant pentosan fraction in wood pulps.

Eisenhut *(26)* and Marschall *(27)* found that the percentage of hemicelluloses rendered soluble by strong sodium hydroxide solutions varies, according to the pretreatment of the pulps. Lindpainter *(28)* concludes that the assumed linkage between pentosans and cellulose can be weakened by different chemical processing of the pulps, and the degree of purity achieved by a subsequent alkaline treatment depends on the previous processing conditions. The results of researches by Klauditz *(29)* reveal that the resistant pentosan fraction in pulps can be decreased by applying more drastic conditions in the pulping stage, or by bleaching the pulps.

Objectives

The object in the first part of the planned investigation was to obtain information of the manner in which resistant pentosans are affected by bleaching wood pulps with hypochlorite, and by hydrolysing them by acids.

The program of work may be outlined briefly as follows:—Sulphite and sulphate softwood pulps were delignified by treating them with alkaline calcium hypochlorite solution in one stage. The prebleached pulps so obtained were washed and treated with dilute hydrochloric acid solution for different periods, to give products with certain solution viscosities in cuprammonium. In parallel experiments, the prebleached pulps were bleached with different chlorine concentrations to yield products with solution viscosities similar to those of the acid hydrolysed samples. The influence of bleaching (oxidation), and of acid hydrolysis, in decreasing the resistant pentosan fraction was investigated by examining the products described above.

Preparation of Samples

In the bleaching experiments, disintegrated pulp at 10% stock concentration (moisture-free) was treated with bleach liquor (calcium hypochlorite) at 32 to 35°C. until the available chlorine was practically all consumed. The pH of the stock was maintained at a value of about 9 by buffering with dilute sodium hydroxide solution. After bleaching, the pulp was washed free of spent liquor, slightly acidified, then washed free of acid, and lapped. The lapped samples were air-dried at 45 to 50°C. and portions were ground in a Wiley mill for analytical investigation.

For the preparation of the acid hydrolysed samples, the pulps were prebleached with calcium hypochlorite. The starting materials for preparing the acid hydrolysed products are designated below as P.B. The disintegrated prebleached samples were hydrolysed at 10% stock concentration (moisture-free), by heating the stock with hydrochloric acid at 100°C. under reflux for different periods. After the acid treatment the samples were washed, lapped, and dried as described above.

Further details of the preparation of the samples are set out in Table I below.

The sulphite pulp used was a product of the Weyerhaeuser Timber Co., Longview, Wash., and the pine sulphate pulps were from the Australian Paper Manufacturers Ltd., Maryvale Mill, Victoria, Australia.

Analytical Methods and Interpretation of Results

The methods of analysis and their interpretation are set out below:

The pentosan content was determined according to the method of Kröber-Tollens *(30)*; ("Total Pentosans").

The solution viscosity in cuprammonium, expressed in poises, was determined by measuring the falling time of metal balls in a 2% pulp dispersion; the cuprammonium solution contained 11.0 gram, copper and 205 gram ammonia per liter.

The "Resistant Pentosans," were determined by treating 1 gram of ground material with 20 ml. of 7% sodium hydroxide solution at 20°C. for 60 minutes. After separating the pulp from the solution on a sintered glass crucible, the residual pulp was

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again treated with 20 ml. of 7% sodium hydroxide solution for 15 minutes. The residue was then filtered, washed with 50 ml. of the caustic solution in the crucible, followed by washings with water, with dilute acetic acid, and again with water. After drying the residual pulp at 105°C. to constant weight during 3 to 4 hours, the pentosan content was determined according to the method of Kröber-Tollens. In this way, the pentosan content of the residue was obtained and recalculated to the weight of original pulp, to give the original resistant pentosan content. (This method of determining the resistant pentosan content follows the procedure outlined by Klauditz *(3)* except for the determination of furfural.)

"Total Removal" refers to the percentage loss of material due to the treatment by 7% sodium hydroxide solution under the test conditions described in *(3)*.

"Pentosan Removal" is the percentage of pentosans removed by 7% sodium hydroxide solution, calculated from the pentosan content of the original sample, the pentosan content of the insoluble residue and the quantity of residue (yield).

"Nonpentosan Removal" refers to the difference between "Total Removal" and "Pentosan Removal"; the percentage "Nonpentosan Removal" gives an approximation of the removal of cellulose and its degradation products from the bleached and acid hydrolysed pulps, since they were practically lignin free.

The practical work was performed by Messrs. W. H. Algar and J. G. Taylor.*

Results

These are listed in Table I together with the details of the methods of preparing the samples. Table II and Fig. 1 show the values for total- and pentosan-removal at equal solution viscosities for the bleached, and for the acid hydrolysed pulps. These values were in most cases obtained by interpolation.

Discussion

The results of the experiments show in the first place that hypochlorite bleaching of the pulps leaves the total pentosan content practically unchanged, whereas acid hydrolysis tends to decrease the total pentosan content. Approximate yield-determinations revealed that under the conditions applied in the acid treatment, much more material is solubilised than during hypochlorite bleaching.

With increasing degrees of bleaching (i.e., the application of increasing chlorine concentrations) the total quantity of material subsequently removed by 7% cold sodium hydroxide solution increases. An increasing degree of acid hydrolysis tends to bring about the opposite effect, inasmuch as the removal of hemicelluloses (total removal) by the caustic soda solution diminishes. Apparently during the acid treatment of the pulps, carbohydrate materials are degraded and some of them pass into solution.

On bleaching the pine sulphate pulps with increasing chlorine concentrations, the pentosan removal by 7% sodium hydroxide solution increases, while it seems to remain practically the same with the differently bleached sulphite samples investigated. The same applies to the nonpentosan removal. The pentosan removal decreases with increasing degree of hydrolysis for the pine sulphate pulps and remains the same for the sulphite pulp.

Before discussing the influence of bleaching, and of acid hydrolysis on resistant pentosans, it should be recalled that the resistant pentosans are only defined by the method of their determination. Sodium hydroxide solution dissolves both pentosans and nonpentosan materials; by dissolving mainly the former, it decreases the pentosan content of the insoluble residue, whilst by dissolving the latter, it increases the pentosan content of the residue. The pentosan content of the insoluble residue will thus be determined by the relative amounts of pentosan and nonpentosan materials dissolved. A decrease in resistant pentosans brought about by bleaching may mean, in some cases, that the caustic soda solution removed less nonpentosan materials than pentosans for a definite total material loss.

Both acid hydrolysis, and hypochlorite bleaching—as expected—lowered the solution viscosity of the samples. It is widely accepted that the solution vis-

* Chemical Assistants, Research Department, Australian Paper Manufacturers, Ltd., Melbourne, Australia.

TABLE I.—SHOWING THE INFLUENCE OF BLEACHING AND OF ACID HYDROLYSIS ON ALKALINE PURIFICATION AND ON RESISTANT PENTOSANS

Processing Conditions	Characteristics of Pulp						
	Viscosity, poises	Total Pentosans, %	Pentosans in Residue, %	Total Removal, %	Pentosan Removal, %	Nonpentosan Removal, %	Resistant Pentosans, %
SOFTWOOD SULPHITE PULP							
Unbleached	34	3.7	1.8	9.7	2.1	7.6	1.6
Bleached with Hypochlorite							
4% Chlorine (P.B.)	5.7	3.9	1.4	11.2	2.7	8.5	1.2
8% Chlorine (P.B.)	1.1	3.8	1.2	12.9	2.8	10.1	1.0
10% Chlorine (P.B.)	0.4	3.7	1.2	14.1	2.7	11.4	1.0
Acid Hydrolysed (a)							
for 30 minutes	4.8	3.1	1.0	11.4	2.2	9.2	0.9
for 60 minutes	0.6	3.2	1.2	11.0	2.1	8.9	1.1
for 240 minutes	0.4	3.2	1.1	11.1	2.2	8.9	1.0
PINE SULPHATE "A"							
Unbleached	15.4	12.3	10.5	4.9	2.1	2.7	10.2
Bleached with Hypochlorite							
3.5% Chlorine (P.B.)	4.9	11.6	4.4	13.0	7.8	5.2	3.8
4.5% Chlorine (P.B.)	3.2	11.2	3.8	13.1	7.9	5.2	3.3
6.0% Chlorine (P.B.)	1.3	11.2	2.9	15.7	8.8	6.9	2.4
Acid Hydrolysed							
for 60 minutes (b)	2.9	11.6	3.5	12.3	8.5	3.8	3.1
for 90 minutes (c)	1.5	10.8	3.2	11.3	8.0	3.3	2.8
for 180 minutes (c)	0.9	10.7	4.2	12.2	7.0	5.2	3.7
PINE SULPHATE PULP "B"							
Unbleached	25	12.5	11.0	1.7	0.2	1.5	10.8
Bleached with Hypochlorite							
5.5% Chlorine (P.B.)	6.9	12.0	4.2	14.4	8.4	6.0	3.6
7.25% Chlorine (P.B.)	4.0	11.4	3.9	13.8	8.0	5.8	3.4
9.0% Chlorine (P.B.)	1.4	11.9	3.4	16.0	9.1	6.9	2.8
Acid Hydrolysed							
for 90 minutes (b)	4.4	11.7	3.9	12.9	8.3	4.6	3.4
for 150 minutes (c)	2.5	11.6	4.4	11.1	7.8	3.3	3.9
for 270 minutes (c)	1.8	11.3	4.5	9.8	7.3	2.5	4.0

(a) 1% Hydrochloric acid solution applied.
(b) 0.5% Hydrochloric acid solution applied.
(c) 2.0% Hydrochloric acid solution applied.

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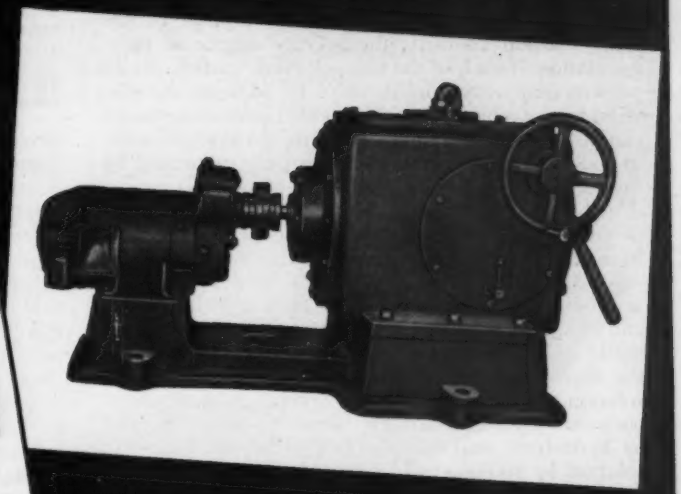

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cosity of the samples. It is widely accepted that the solution viscosity in cuprammonium may be interpreted as a measure of the average degree of polymerisation of the polymeric carbohydrates in fibers, provided that the molecules do not contain alkali sensitive linkages, which would cause a further breaking down of the chains in the cuprammonium solution *(32)*. However, the solution viscosity in cuprammonium does not reveal the average degree of polymerisation of the cellulose and of the pentosans individually; both contribute to the solution viscosity. Thus, for differently processed wood pulps of the same solution viscosity, the average degree of polymerisation of each of the two polymeric carbohydrates present may vary considerably. In addition the distribution of chain length of both chain components can also differ. The solubility of these chain polymers in sodium hydroxide solution is greatly influenced by the chain length, and by the degree of poly-dispersity. The lack of information on the average degree of polymerisation of the cellulose- and pentosan-chains in the investigated preparations is a serious limitation, when their behaviour towards *7%* cold sodium hydroxide solution is considered. Similarly the nature and extent of the chemical modification of both polymeric carbohydrates was not investigated, nor was the depolymerising action of the sodium hydroxide solution itself studied. The chemical modification of both carbohydrates, brought about by oxidation, and by hydrolysis, may considerably influence their dissolution by sodium hydroxide solution.

On the grounds of the foregoing arguments, great care must be exercised when comparing the bleached and the acid hydrolysed pulps, and only general trends can be formulated.

With *7%* sodium hydroxide solution the total removal is somewhat greater from the bleached than from the acid hydrolysed samples. It appears likely that hypochlorite in alkaline medium preferentially oxidises to carboxyls *(33)* the primary alcoholic group in the cellulose molecules. The greater percentage removal from the bleached pulps may be accounted for by the presence of carboxyl groups in the cellulose, tending to increase its solubility. The removal of nonpentosan materials increases with progressive bleaching as shown by the values in Table I. Oxidation by hypochlorite apparently also brings about a more favourable condition for the removal of pentosan materials of *7%* sodium hydroxide solution than does acid hydrolysis. It is, however, possible that, by further treatment, the cellulose becomes depolymerised to such an extent that the removal of nonpentosan materials by cold alkali may exceed that of the pentosan materials, resulting in fibers with an increased pentosan content. This seems to occur when the pulps have been too strongly hydrolysed with acid, and the subsequent sold alkali solution dissolves more nonpentosans; the alkali purified pulps have a higher pentosan content, than the milder hydrolysed and alkali treated pulps.

Relatively mild hypochlorite bleaching—as mentioned—brings about a favourable removal of pentosans in the subsequent alkali treatment. In view of the recognized fact that the nature of the physical and chemical modifications of cellulose and pentosans produced by the action of hypochlorite, and by acid, is not known exactly, it is rather difficult to offer an unequivocal explanation for this observation. Very little is known of the mechanism of the elementary processes, involved in the removal of hemicelluloses from fibers by sodium hydroxide solution in the presence of atmospheric oxygen. The uncertainty in determining and interpreting the pentosan content of fibers, swollen due to treatment with strong alkaline solutions, makes the analytical results more difficult to evaluate. Reference has already been made to the absence of information regarding the average degree of polymerisation, the chain length distribution of cellulose and pentosans present in the pulps, and the quantity of material removed during the pre-treatment of the samples. (Hydrolysis and bleaching.) All these contribute to the difficulty of explaining the observation referred to above. Several factors may be described as possibly contributing to the greater removal of pentosans from the bleached than from the acid hydrolysed pulps; (a) breaking of assumed linkages between cellulose and pentosans (and lignin) by oxidation, rendering the fibers more accessible for the alkali solution, (b) greater swelling by the alkaline hypochlorite solution than by the hot acid solution, liberating more surface for reaction with the cold alkali solution, (c) removal of residual lignin through oxidative degradation and dissolution by the alkaline hypochlorite, resulting in a greater surface for reaction, and (d) solubilisation of the break-down products of polyuronides, which in the original pulp appear as pentosans, since they yield furfural in the customary method of determining pentosans. Much work appears to be needed to support by experimental evidence the validity of the arguments put forward.

The relation between surface properties of fibers and resistant pentosans, as affected by drying pulps, is the subject of a further study, the results of which will be presented in a forthcoming paper.

TABLE II—SHOWING THE REMOVAL OF HEMICELLULOSIC MATERIALS BY COLD STRONG ALKALI SOLUTION FROM DIFFERENTLY PROCESSED WOOD PULPS AT EQUAL SOLUTION VISCOSITY

	At 4 Poises		At 1 Poise	
SOFTWOOD SULPHITE PULP	Hydrolysed	Bleached	Hydrolysed	Bleached
Total removal, %	11.5	12.2	11.1	13.0
Pentosan removal, %	2.2	2.8	2.1	2.7
PINE SULPHITE PULP "A"				
Total removal, %	12.4	13.1	12.0	17.0
Pentosan removal, %	8.8	7.8	7.3	9.1
PINE SULPHATE PULP "B"				
Total removal, %	12.6	13.8	9.0	17.8
Pentosan removal, %	8.2	8.0	6.5	9.4

Acknowledgement

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Northern New York TAPPI Discusses Silicates

The Northern New York Group of the TAPPI Empire State Section met at Watertown, N. Y., on Thursday evening, February 13th. About 60 attended. William Steriker of the Philadelphia Quartz Company, Philadelphia, Pa., presented a paper on "The Various Uses of Sodium Silicates and Their Derivatives in the Paper Industry."

The next meeting will be held at the Hotel Woodruff, Watertown, N. Y., on March 13th. J. E. Foote and R. E. Baker of the B-F-D Company will present a paper on "The Modern Methods in the Manufacture of Sulphite Pulp."

Those present included: A. Alcombrack, R. J. Hackett, J. P. Ormsby, D. A. Hunter, Dr. Steriker, E. A. Godfrey, Karl L. Pingrey, Sheldon J. Young, Harold W. Peck, F. J. Hoar, H. Spencer, M. D. Myers, R. A. Schwartz, R. S. LaRue, G. Duers, O. C. Munger, C. S. Booth, Stanley Donaldson, John H. Treadwell, W. P. Barnard, E. A. Mahannah, C. Jewell, E. T. A. Coughlin, F. C. Goodwell, Thomas Gerace, C. Wells Clark, Thomas M. Burton, D. C. Mather, R. L. Lewis, R. D. Lewis, L. J. Gilligan, James Beckett, Jr., B. H. Treadwell, Chas. M. Durkee, Walter Dempsey, Homer M. Rice, Tom E. Loessi, P. D. Switzer, Norman Siems, E. F. Tucker, J. E. Keib, Chas. J. Slack, C. E. Slack, W. G. Forbes, H. T. Randles, W. B. Mills, H. F. Greeney, T. Newcomb, Carl Kops, W. E. Roubie, Wm. Martin, Jr., T. E. Detcher.

Lake States Section of TAPPI to Meet

The next meeting of the Lakes States Section of TAPPI will take place Tuesday, March 11, 1947, 6:30 p.m., at the American Legion Club House, Appleton, Wisconsin. Mr. M. N. Taylor, Executive Director of Trees for Tomorrow, Inc., of Merrill, Wisconsin, will speak on "Trees for Tomorrow".

The May meeting of the Lake States Section will be held in Madison, Wisconsin, May 9, 1947. The program will be arranged by the Forest Products Laboratory starting with a tour through the laboratories about 3:00 p.m. and followed by a dinner at one of the local hotels. At least two well-known speakers will address the section after the dinner. All those who expect to be in Madison for this meeting and wish to stay overnight in Madison should make their hotel reservations as early as possible.

TAPPI Notes

Parker McIntosh, formerly of the E. B. Eddy Company, is now plant superintendent for the Woods Mfg. Company, Montreal, P. Q.

Francis H. Ludwig, formerly of Pacific Mills Ltd. is now with Bloedel, Stewart & Welsh, Ltd., Port Albernie, B. C.

Walter E. Riley, formerly of the B-F-D Company, is now assistant to the chief engineer, Howard Smith Paper Mills, Ltd., Montreal, P. Q.

G. E. Landt, president of Philadelphia Textile Finishers, Inc., is now located at Ford and Lafayette Streets, Norristown, Pa.

Benjamin D. Levine, formerly of the Minerva Wax Paper Company, is now chemist for the Orchard Paper Company, St. Louis, Mo.

Alan P. Adrian is now technical director of the Neenah Paper Company, Neenah, Wis.

Kristian Fougner, formerly of the University of Maine, is now engineer for the Kennebec Pulp and Paper Company, Augusta, Maine.

J. McK. Limerick is now technical director of the Bathurst Power and Paper Company, Ltd., Bathurst, N. B.

The Hudson Valley Group of the Empire State Section of TAPPI will meet on February 21st at the Queensbury Hotel in Glens Falls for a dinner meeting at 7 p.m.

Glenn O. Neimeyer, chemical engineer for the Stone & Webster Engineering Corporation, has been transferred from Boston to Oakdale, La.

Wilbur M. Hayes, formerly of the Minnesota and Ontario Paper Company, is now engineer for Chas. T. Main, Inc., Boston, Mass.

Charles H. Reese is now vice president in charge of manufacturing for the Nekoosa Edwards Paper Company, Port Edwards, Wis.

J. Stokes Clement, Jr., of the Sandura Company, Inc., has been transferred from Philadelphia to Paulsboro, N. J.

Ronald W. Hynes is now president of the Newton Falls Paper Company, Newton Falls, N. Y.

Colin Gardner, III, is now secretary of the Gardner-Richardson Company, Middletown, Ohio.

Frank C. Campins, formerly of National Starch Products, Inc., is now with Polymer Industries, Inc., 1108 30th Avenue, Astoria, N. Y.

John A. MacArthur, formerly of the Long Lac Pulp & Paper Company, is now engineer for the Stadler, Hurter & Company, Montreal, P. Q.

Uno G. Fryklund, formerly of the Nensjo Sulphate Mill, is now mill manager of Kramfors A/B, Kramfors, Sweden.

Gerald F. Green, formerly of the Puget Sound Pulp & Timber Company, is now chemist for Fibreboard Products, Inc., Port Angeles, Wash.

S. Roy Turner, formerly of the Central Paper Company, is now mill manager of the Combined Locks Paper Company, Combined Locks, Wis.

George V. N. Morin, formerly of the Resinous Products & Chemical Company, is now development engineer for the Masslinn Div., Chicopee Mfg. Corporation, Milltown, N. J.

Leslie S. Simser of the American Cyanamid Company, has been trasferred from Watertown, N. Y. to Appleton, Wis.

Samuel R. Olsen of the Champion Paper & Fibre Company has been transferred from Hamilton, Ohio to Houston, Texas.

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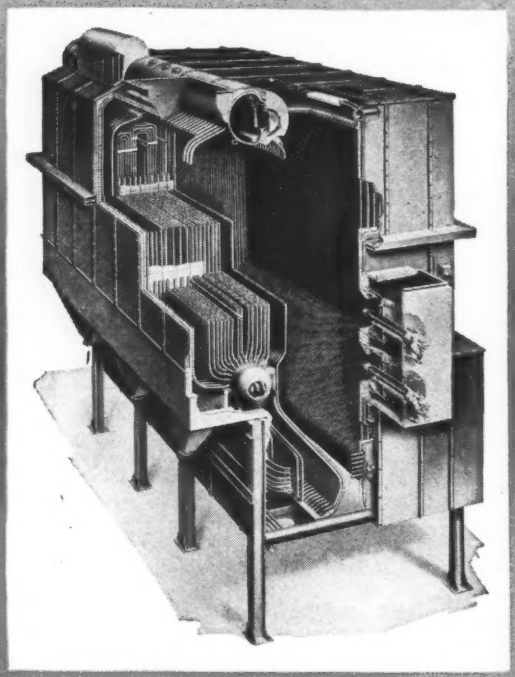

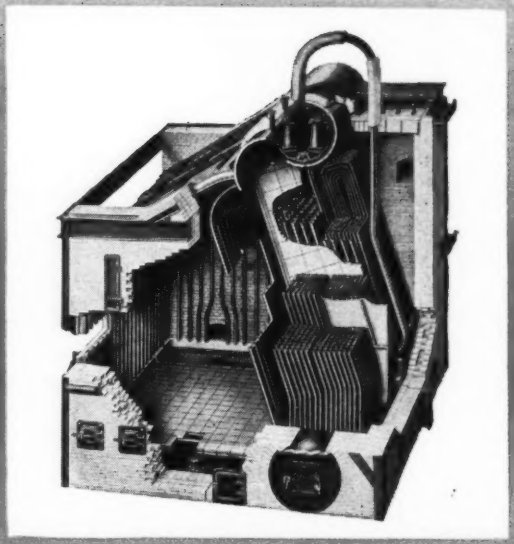

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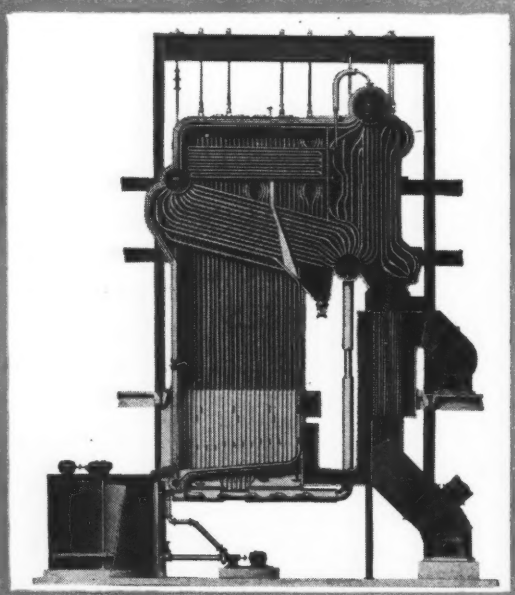

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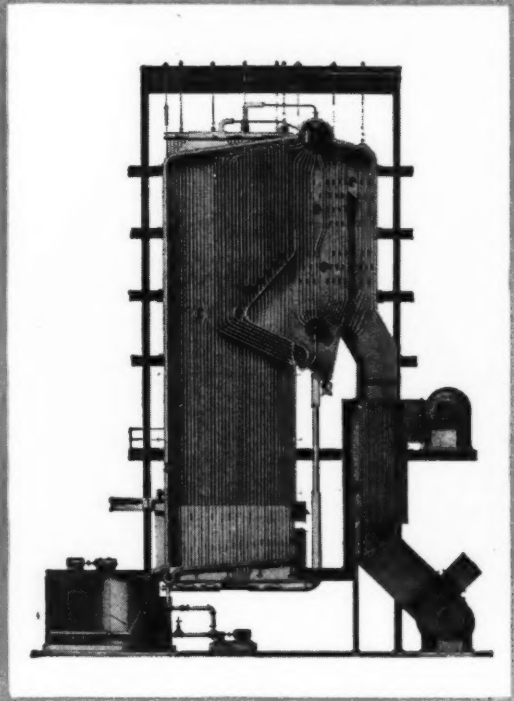

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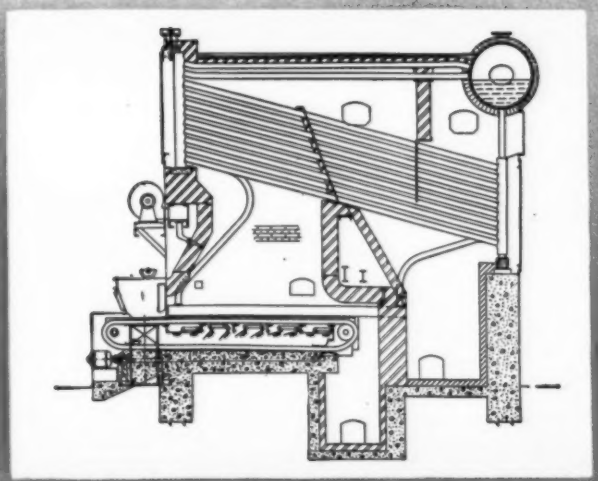

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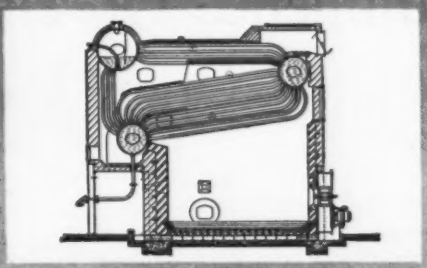

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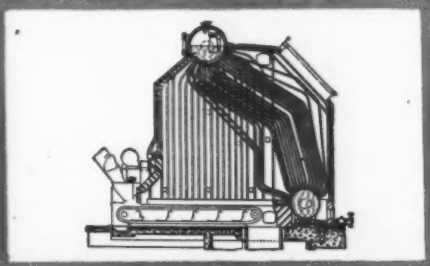

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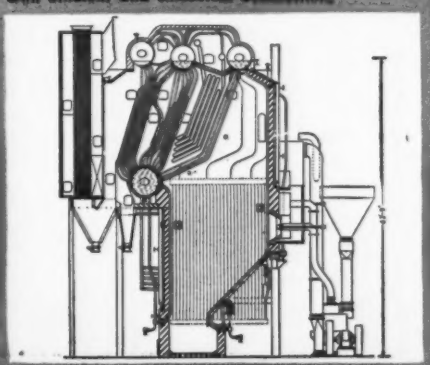

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Influence Of Tension During Drying Upon Paper Strength*

By J. E. Sapp[1] and W. F. Gillespie[2]

Abstract

The loss in bursting strength on a fourdrinier machine was found to be approximately 16% on the wet end and 20% in the drier section.

When handsheets are dried under unidirectional tension, large losses in bursting strength may occur, the loss being dependent upon the amount of tension during drying and, to a certain extent, upon the degree of refining of the pulp. Consideration of the changes in tensile strength and per cent elongation brought about by drying under tension leads to the conclusion that loss in bursting strength is caused chiefly by decrease in per cent elongation in the direction in which tension is applied, with decrease in tensile strength a contributing factor if the sheet is dried under excessive tension. These changes are caused not by distortion of the wet sheet but by drying it while so distorted.

Handsheets dried under unidirectional tension are much more similar to machine made paper than are handsheets made according to the usual procedures.

In the operation of a paper machine, each section of the wet end runs slightly faster than the preceding section, causing the sheet to be stretched by a small amount. The sheet, after entering the drier section, is dried under tension so that little shrinkage can occur in the machine direction, shrinkage in the cross direction being hindered but not prevented, by the action of the drier felts.

It has long been recognized that such treatment may be detrimental to paper quality, Adams *(1)*, Briner and Guild *(2)*, and Minton *(6)*, reporting that bursting strength is lowered by drying under tension. More recently, Cottrall and Gartshore *(5)*, have found that approximately 24% of the potential bursting strength of the pulp is lost because of inferior making on the wet end and 15% because of drying under tension.

On the other hand, Reith *(7)*, found that sheets dried under tension on a cylinder had a higher tensile strength than air dried sheets, while Robertson and Bailey *(8)*, noted an increase in tensile strength both with and across the machine when the sheet passed through the drier section of an experimental fourdrinier machine. Robertson and Bailey also found that per cent elongation under the tensile breaking load decreased in the machine direction and increased in the cross direction. Carter *(3)*, in studying the effect of tension at the draws, confirmed the conclusions of Robertson and Bailey insofar as tensile strength is concerned.

Since, as shown by Carson and Worthington *(4)*, bursting strength depends upon tensile strength and per cent elongation, both in the machine direction, paper might lose bursting strength while gaining in tensile strength if the per cent elongation should decrease sufficiently.

The purposes of the present study were, first, to ascertain the loss in bursting strength caused by machine drying and, second, to establish by laboratory experiment the influence of tension during drying upon tensile strength, per cent elongation, and bursting strength, thereby gaining a clearer insight into the causes for strength variation on the paper machine.

Loss in Bursting Strength on the Machine

The machine investigated was a fourdrinier, running unbleached kraft bag and wrapping papers.

* Presented at the meeting of the Technical Association of the Pulp and Paper Industry held at the Hotel Roosevelt, New Orleans, La., Oct. 14-15, 1946.

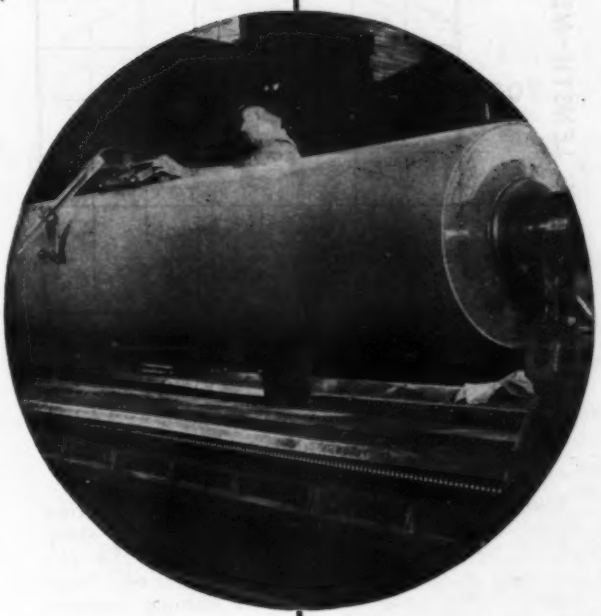
[1] Member TAPPI; Chemical Engineer, Gaylord Container Corp., Bogalusa, La.

[2] Member TAPPI; Technical Director, Gaylord Container Corp., Bogalusa, La.

TABLE I.—PHYSICAL PROPERTIES OF HANDSHEETS DRIED UNDER TENSION

Freeness, ml.-S.R.[1]	Amount Stretched, %	Basis Weight, lb.[2]	Tensile Breaking Length, Meters				Elongation, %		Bursting Strength, %
			MD[3]	CD	Ratio, MD/CD	Mean	MD[3]	CD	
670	0.0	48.4	5930	5190	1.14	5560	3.1	5.1	108
	0.5	48.1	6220	5310	1.17	5770	2.4	4.9	98
	1.0	48.0	6380	5080	1.26	5730	2.4	5.1	89
	1.5	47.0	5920	5160	1.15	5160	1.7	5.0	82
	2.0	48.3	6230	4720	1.32	5480	1.8	5.6	77
	2.5	47.3	5840	4750	1.23	5300	1.6	5.7	65
475	0.0	49.8	6670	6190	1.08	6430	3.7	6.4	126
	0.5	46.9	7000	6120	1.14	6560	3.1	6.2	104
	1.0	48.1	7370	6380	1.16	6880	2.7	6.9	110
	1.5	46.6	7120	5820	1.22	6470	2.4	6.8	91
	2.0	47.0	6700	5910	1.13	6310	2.2	6.8	85
	2.5	47.5	6940	5370	1.29	6160	1.8	7.1	82
	3.0	48.1	6780	4950	1.37	5870	1.8	7.1	79
	3.75	48.0	6350	4650	1.37	5500	1.6	7.1	66
375	0.0	46.1	7630	7000	1.09	7320	3.9	6.8	127
	0.5	47.5	8150	6790	1.20	7470	3.1	6.9	122
	1.0	44.4	8430	6630	1.27	7530	2.5	6.2	108
	2.0	45.1	8190	6570	1.24	7380	2.1	7.0	100
	2.5	44.1	8090	6470	1.25	7280	1.9	6.2	94
	3.0	45.1	7750	6050	1.28	6900	1.6	7.2	85
	3.75	44.9	7540	5350	1.41	6450	1.4	7.0	79
225	0.0	43.8	8140	7410	1.10	7780	3.8	8.3	127
	1.5	43.2	8500	6950	1.22	7730	2.4	8.4	108
	2.0	42.7	8780	6950	1.26	7870	2.5	8.2	104
	3.0	42.3	8590	6860	1.25	7730	2.1	8.9	97
	3.5[4]	44.1	8410	6130	1.37	7270	1.8	8.9	90

[1] Five gram sample.
[2] 24 × 36 — 480 ream.
[3] The direction in which tension was applied.
[4] With this pulp no attempt was made to ascertain the maximum possible degree of stretching.



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Samples of pulp were taken from the machine headbox and the bursting strength of handsheets made from this pulp compared with that of samples taken from the reel. Also, samples of the wet sheet entering the driers were taken, dried in the laboratory, and the bursting strength of these samples compared with that of samples from the reel. A small drum drier was used for drying both the handsheets and the wet samples from the machine.

Average results based on handsheets as 100% are as follows: Bursting strength handsheets = 100; Bursting strength paper entering drier section = 84; Bursting strength samples from the reel = 64.

Thus, taking the strength of handsheets as standard, approximately 16% of the potential bursting strength is lost on the wet end and 20% in the driers. In view of the many variables in machine construction and operation these figures are considered to be in fair agreement with those of Cottrall and Gartshore *(5)*.

Drying Laboratory Handsheets Under Tension

Experimental Procedure

In order to be able to dry handsheets while stretched by various known amounts, an approximately 8 × 10 inch rectangular steel frame was constructed, having a lower fixed jaw and an upper jaw which could be moved up or down by means of a calibrated thumbscrew. The same general procedure was followed in all experiments:

1. Beating was done in a Valley Iron Works experimental beater, using samples from the same lot of machine dried unbleached sulphate pulp.
2. Handsheets were formed and pressed by the standard method of this laboratory. Each set for testing purposes consisted of seven sheets.
3. Prior to drying, the 8-inch diameter sheet was removed from its blotter and trimmed to a width of about 6 inches. It was then clamped in the steel frame, stretched the desired amount, and dried in a laboratory oven at 100°C.
4. All sheets were conditioned at 65% RH and 70°F. for at least 12 hours before testing.

Two series of experiments were run. In the first (Table I, Figs. 1, 2, 3, 4) sheets at four different

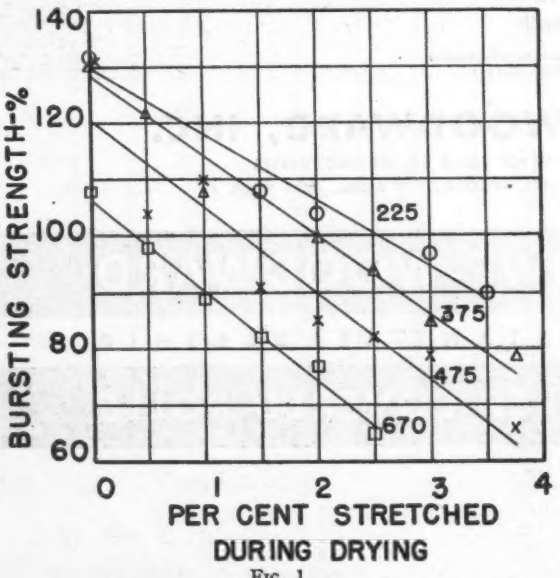

Fig. 1
Effect of Drying Tension Upon Bursting Strength: Pulps of Different Degrees of Refining at Various Freenesses

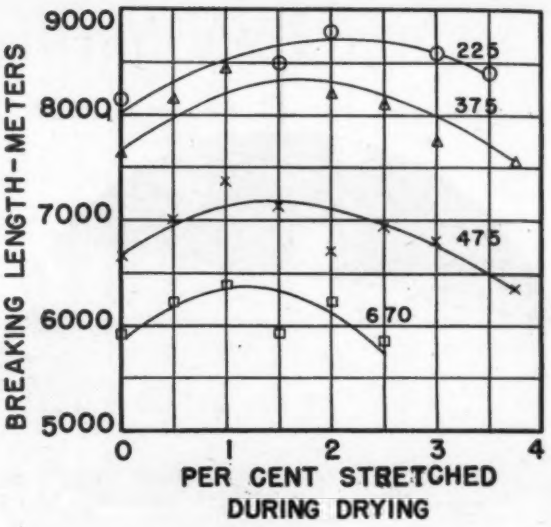

Fig. 2
Effect of Drying Tension Upon "Machine Direction" Tensile Strength at Various Freenesses

degrees of refining were dried while stretched from zero to the maximum limit determined by the sheet breaking during drying; in the second (Table II) after first stretching the sheet a comparatively large amount, it was then released by various amounts before drying. Finally several samples of pulp taken from the machine headbox were made into handsheets, dried under tension and the strength of these sheets compared with that of machine dried paper.

Effect of Tension Upon Bursting Strength

In Fig. 1, the variation in bursting strength with stretching during drying is shown. The bursting strength diminishes approximately as a straight line function of the amount of stretching, reaching, when the sheet is dried almost at its breaking point, a value around ½ to ⅔ that of the strength of the unstretched sheet. With well beaten pulps, for example that of 225 ml. freeness, the bursting strength does not fall as rapidly as with pulps of higher freeness. The practical conclusion to be drawn from these results is that the bursting strength of paper will increase in direct proportion to the slackening of tension during its passage through the machine, and that a poorly refined pulp may be made into paper of relatively high bursting strength if the machine is run so as to avoid any unnecessary tension.

Effect of Tension Upon Tensile Strength

In Fig. 2, "machine" direction tensile strength is plotted against the amount of stretching during drying. As the sheet is stretched by larger amounts, tensile strength rises, passes through a maximum value 5 to 10% higher than that of the unstretched sheet, then falls, and may reach a final strength slightly less than that of the unstretched sheet. It may, therefore, be concluded that, as reported by Robertson and Bailey *(8)*, a rise in machine direction tensile strength should ordinarily occur when the sheet passes through the drier section. However, if the sheet should be under tension almost sufficient to cause a break in the driers, a lower tensile strength might result.

Cross direction tensile strength does not rise ini-

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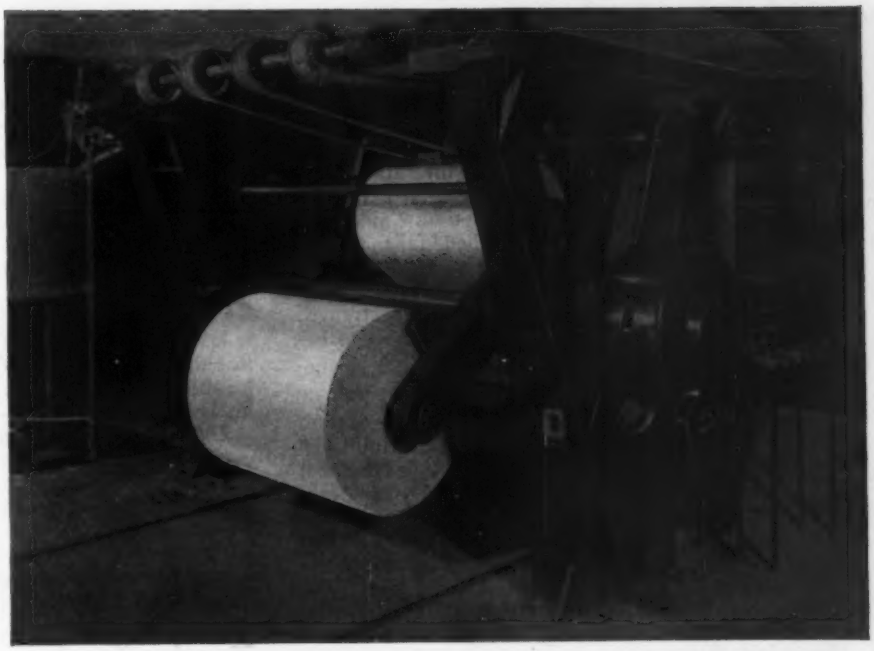

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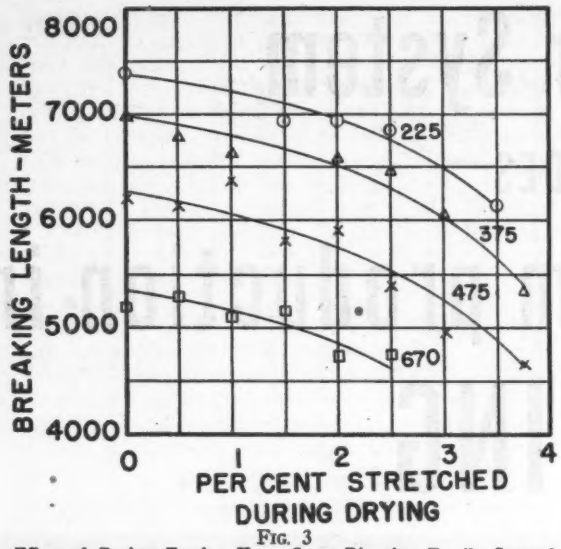

FIG. 3

Effect of Drying Tension Upon Cross Direction Tensile Strength at Various Freenesses

tially but decreases, at first slowly then at an increasing rate as the sheet is stretched by larger amounts (Fig. 3).

In Table I, the mean of "machine" direction and cross direction tensile strengths, and the ratio of the two are also tabulated. It will be observed that the mean rises somewhat during the time "machine" direction tensile strength rises, then falls rapidly thereafter, when both MD and CD strengths are decreasing. However, the ratio of MD:CD continues to increase even in the period when strength in both directions is falling, causing the sheet to become more directional in its properties.

Effect of Tension Upon Per Cent Elongation

The property of the sheet most affected by tension during drying is the amount it will stretch in the "machine" direction before breaking. (Per cent elongation). This is shown in Fig. 4 in which "machine" direction elongation is plotted against the extent of stretching during drying, the results for the pulps of highest and lowest freeness being shown. These curves and the data of Table I show that there is a pronounced loss of elongation with even small amounts of stretching, the rate of decrease becoming slower as tension is increased.

Elongation in the cross direction is not greatly changed, though the results of Table I indicate a slight gain with greater drying tension.

Since with moderate drying tension "machine" direction tensile strength increases, it is evident that the initial loss in bursting strength must be due entirely to the drop in per cent elongation; with high drying tension, MD tensile strength also decreases, thereby contributing to the continued rapid, loss of bursting strength.

Effect of Releasing Tension Before Drying

By comparison of the results listed in Table II with the corresponding results of Table I, it is clear that when the stretched sheet is partially released before drying, its strength properties are very nearly the same as if the sheet had not originally been stretched by any larger value than that to which it is released. The loss in bursting strength and changes in other characteristics are, therefore, caused by drying under tension, not by deformation of the wet sheet. Stretching on the wet end of the machine should, therefore, cause little loss in strength if it were possible to allow the sheet to resume its original dimensions while drying. However, if the sheet is stretched and then not allowed to shrink while drying, very decided changes in strength will occur.

TABLE II.—PHYSICAL PROPERTIES OF HANDSHEETS STRETCHED THEN PARTIALLY RELEASED BEFORE DRYING. PULP OF 225 ML. S.R. ALL HANDSHEETS ORIGINALLY STRETCHED 3.5%

Amount Stretched, %	Basis Weight, lb.	Tensile Length, meters, MD	Breaking meters, CD	Elongation, % MD	Elongation, % CD	Bursting Strength, %
0.5	44.6	7860	6600	3.2	9.1	119
1.0	43.3	8230	6690	2.1	8.3	120
1.5	44.6	8680	6600	3.1	8.7	108
2.0	43.6	8500	6870	2.6	9.1	111
2.5	43.4	7860	6240	2.7	8.5	103
3.0	45.3	8230	6600	2.1	9.4	104

In order to show the points of resemblance between paper dried under tension in the laboratory and machine dried paper, the two examples of Table III are given.

While no particular efforts were made to find the exact degree of stretching for the best duplication of the properties of machine made paper, it is, nevertheless, apparent that by drying under tension, laboratory handsheets can be made which resemble machine dried paper much more closely than to those made by the usual procedures, particularly in bursting strength and machine direction tensile strength and elongation. It is also interesting to note that paper sample 2 was higher in bursting strength than sample 1 despite the fact that it was made from pulp of a lower degree of refining and had a lower tensile strength. That this was undoubtedly due to the paper being run under lower tension in the former case is shown by the higher elongation of sample 2.

Summary

1. The loss in bursting strength on a fourdrinier machine, taking laboratory handsheets as standard, has been found to be 16% on the wet end and 20% in the driers.

2. The effects of increased tension during drying upon the strength properties of handsheets are:

(a) Bursting strength decreases rapidly, approximately as a straight line function of the extent of stretching.

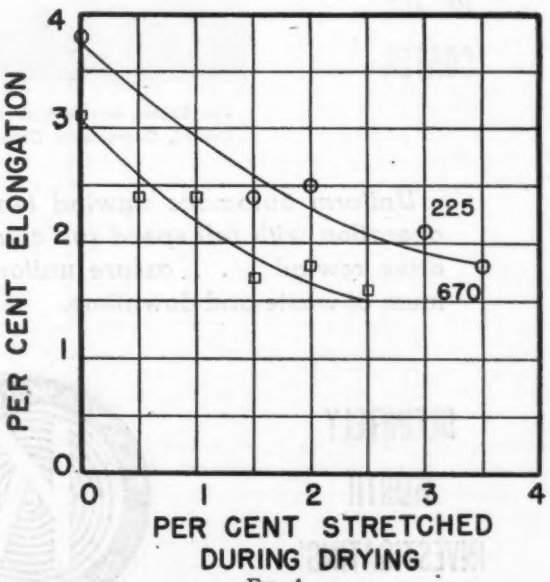

FIG. 4

Effect of Drying Tension Upon "Machine Direction" Elongation at Various Freenesses

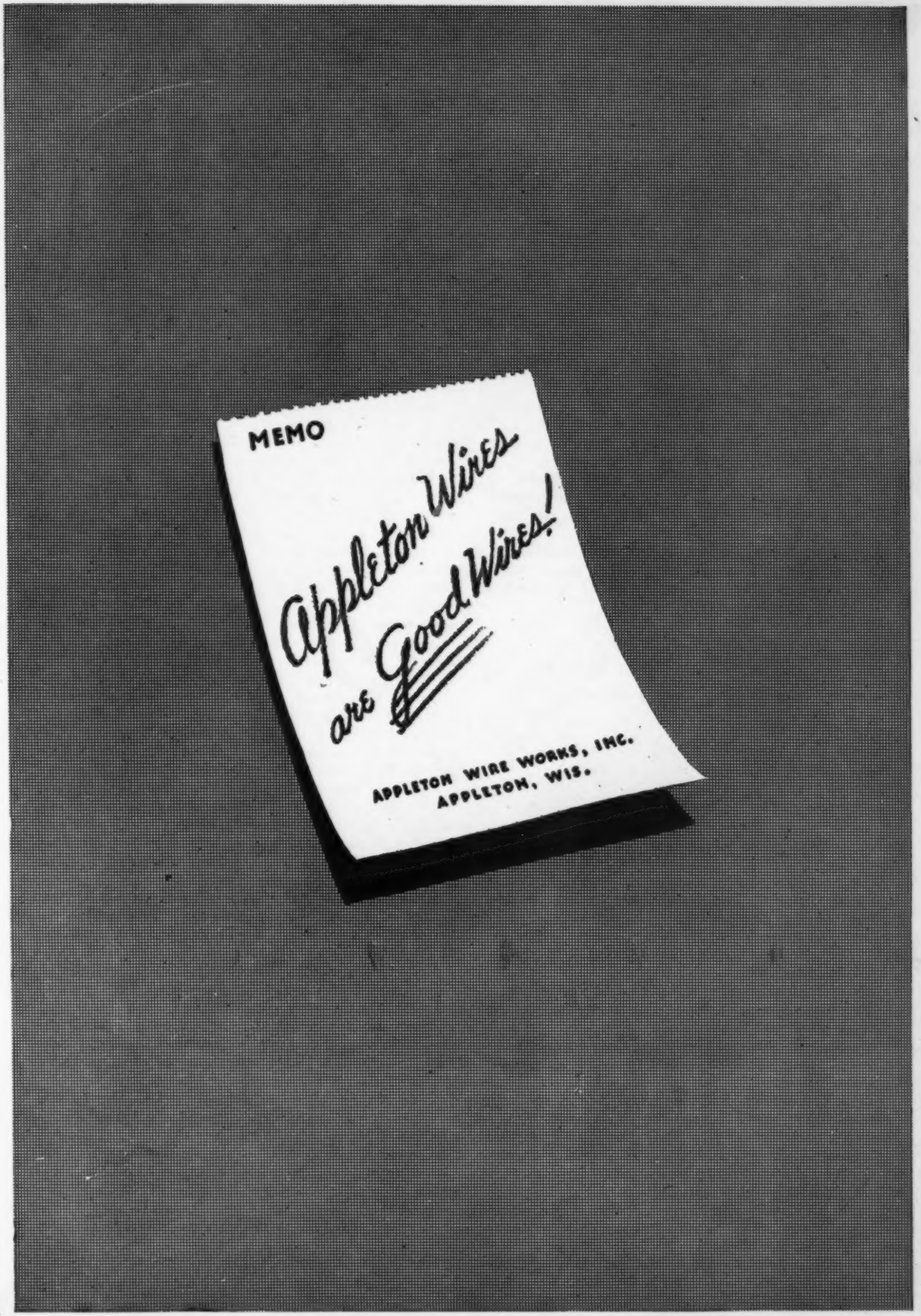
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TABLE III.—COMPARISON OF MACHINE DRIED PAPER AND HANDSHEETS DRIED UNDER TENSION

	Handsheets Stretched 0.0					Handsheets Stretched 3.0%					Paper				
	Tensile Breaking Length, meters		Elongation, %		Burst, %	Tensile Breaking Length, meters		Elongation, %		Burst, %	Tensile Breaking Length, meters		Elongation, %		Burst, %
	MD	CD	MD	CD		MD	CD	MD	CD		MD	CD	MD	CD	
Sample 1—460 ml. S.R.....	5590	4940	2.7	6.7	91	6600	4590	1.6	7.0	74	6890	3320	1.7	3.9	78
Sample 2—530 ml. S.R.....	5960	4950	2.8	5.6	101	5900	4090	1.6	5.6	72	5960	3780	2.3	3.8	84

(b) Tensile strength in the direction in which tension is applied at first increases, reaches a maximum value 5 to 10% greater than that of the unstretched sheet, then decreases.

(c) Tensile strength in the cross direction diminishes, at first slowly, then more rapidly as stretching is increased.

(d) Elongation in the direction in which tension is applied falls sharply at first then at a slower rate with increasing tension.

(e) Elongation in the cross direction is not greatly affected.

3. The major cause for loss in bursting strength is the decrease in machine direction elongation, with loss in machine direction tensile strength a contributing factor at high degrees of stretching.

4. The loss of bursting strength caused by drying under tension is apparently somewhat dependent upon the degree of refining, a slow pulp losing strength less rapidly than a free one.

5. The properties of handsheets dried under tension resemble those of machine dried paper much more closely than do the properties of handsheets made in the usual manner.

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New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Tony Agronin, in Charge of Engineering, Shartle Bros. Machine Co., Middletown, Ohio, a 1933 graduate of Syracuse University.

John H. Allan, Student, New York State College of Forestry, Syracuse, New York. He expects to graduate in June, 1947.

Francisco A. Bustelo, Consulting Engineer, Sniace, Madrid, Spain, a 1923 graduate of Escuena de Caminos, Spain.

Raoul V. Cambier, President, Harticell S.A., Antwerp, Belgium, a 1925 graduate of Athenee Royal d'Anvers, Belgium.

Preston D. Carter, Industrial Engineer, Kalamazoo Vegetable Parchment Co., Kalamazoo, Michigan, a 1937 graduate of Cornell University.

Frank E. Caskey, Research Chemist, Crown-Zellerbach Corp., Camas, Washington, a 1941 graduate of Oregon State College.

Myron J. Clark, Packing Engineer, Inland Container Corp., Indianapolis, Indiana, a 1932 graduate of Rose Polytechnic Institute.

William B. Csellak, Student, Institute of Paper Chemistry, Appleton, Wisconsin, a 1940 graduate of Lehigh University.

Charles E. Foley, Sales Research Manager, Nashua Gummed & Coated Paper Co., Nashua, New Hampshire. Attended Lowell Textile Institute.

Mark E. Fretz, Chemical Engineer, Detroit Sulphite Pulp & Paper Co., Detroit, Michigan, a 1939 graduate of Tri-State College.

Emile P. Gaillet, Exporter of Paper Machinery and Raw Materials, 250 Park Avenue, New York City, a 1924 graduate of the University of Lille, France.

George W. Goels, Jr., Chief Engineer, Blandin Paper Co., Grand Rapids, Michigan, a 1936 graduate of Iowa State College.

Mario R. Guell, Chief Draftsman, Gaylord Container Corp., Bogalusa, Louisiana, a 1936 graduate of Louisiana State University.

Walter L. Hearn, Chemical Engineer, Brown Company, Berlin, New Hampshire, a 1925 graduate of the University of Michigan.

Frank J. Hoffman, III, Apprentice Salesman, Harvey Seybold & Co., Cincinnati, Ohio. Attended the University of Cincinnati.

James C. Inghram, Chief Chemist, A & P Coffee Service, Brooklyn, New York, a 1924 graduate of Pennsylvania State College.

James E. Johnson, Student, New York State College of Forestry, a 1943 graduate of the University of Washington.

H. Carlos Kinkel, Manager of Paper Mill, La Aurora S.A. Fabrica de Papel, Mexico City, Mexico.

Claus J. Koren, Chief Chemist, Saugbrugsforeningen, Halden, Norway, a 1933 graduate of the Norwegian Technical University.

Frank B. Lake, Chemical Engineer, Detroit Sulphite Pulp & Paper Co., Detroit, Michigan, a 1942 graduate of Purdue University.

Rene P. Lapeze, Professor of Chemistry, French School of Paper Making, Institut Polytechnique de Grenoble, France. He is a graduate of the University of Grenoble.

Lyle L. McGladrey, Mechanical Engineer, Wood Conversion Co., Cloquet, Minnesota, a 1928 graduate of the University of Minnesota.

Peter MacLaurin, Managing Director in Charge of Production, Smith & McLaurin Ltd., Renfrewshire, Scotland, a 1926 graduate of Bryanston, Dorset, England.

Cyril H. Marsh, Research Physicist, The Metal Box Co. Ltd., Manchester, England, a 1936 graduate of the University of London.

Kenneth C. Nicholson, Research Department, The Carborundum Co., Niagara Falls, New York, a 1914 graduate of the Carnegie Institute of Technology.

Robert G. Oliver, Director, David Bentley Ltd., Manchester, England, a 1935 graduate of Manchester University.

Walter D. Potterf, Quality Supervisor of Paper, U. S. Gypsum Co., Rahway, New Jersey. He attended Purdue University.

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PAPER

Collection Of Sulphate Turpentine*

By W. P. Lawrence[1]

Abstract

A summary giving the results of a questionnaire pertaining to the equipment and operating conditions for the collection of sulphate turpentine is presented. Replies were received from twenty-four mills in the Southern, Southeastern and Lake States areas.

Data are given on the yield from various wood species, digester operation, separator and condenser construction and methods of storage.

The TAPPI Chemical Products Committee has received within the past two years a number of inquiries concerning various phases of sulphate turpentine collection. This chemical product of the sulphate pulping industry has steadily grown in importance as a commodity, as is borne out by data compiled by the United States Department of Agriculture *(1)*. In the eight years from 1938-39 to 1945-46, inclusive, the production of gum spirits dropped off more than half, while steam distilled wood turpentine showed no net gain. Meanwhile, production of sulphate turpentine almost tripled, increasing from 40,000 to 110,000 barrels per year. Production of sulphate turpentine is now almost half that of gum spirits, whereas eight years previous, it was less than one-tenth. It now amounts to approximately 23% of the total production of turpentine in the country.

* Presented at the meeting of the Technical Association of the Pulp and Paper Industry held at the Roosevelt Hotel, New Orleans, La., Oct. 14-15, 1946.

[1] Member TAPPI; Research Engineer, Champion Paper and Fibre Co., Canton, N. C.

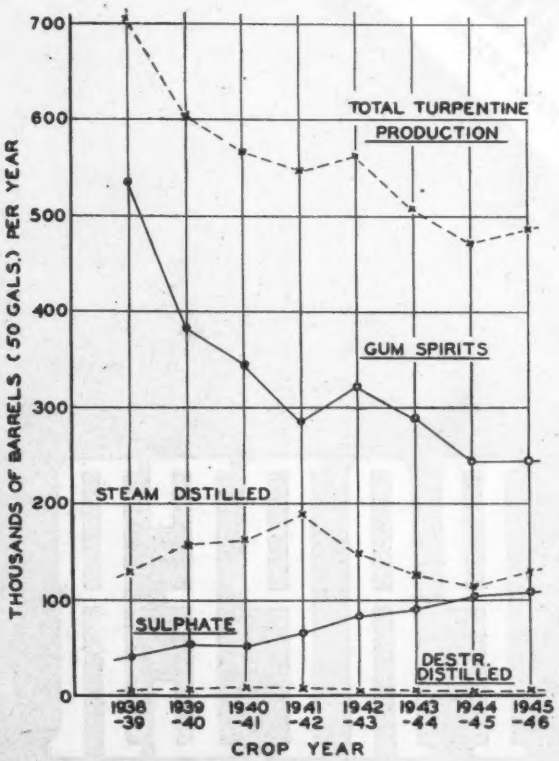

FIG. 1

In view of the importance of this product, and of the interest in its production, a questionnaire was circulated to kraft mills cooking pine to cover various phases of collection of the crude sulphate turpentine. The questionnaire did not cover refining which is not practiced by all of the mills which collect turpentine. Responses were received from twenty-four mills in the Southern, Southeastern, and Lake States areas.

The procedure for collecting sulphate turpentine is fairly well standardized. Vapors relieved during the cooking of pine wood are passed through separators to remove entrained liquor and fiber. The separators usually are of the cyclone type, and some mills employ more than one. Where two or more separators are used, they are operated in series or parallel. From the separator, the vapors then pass to a condenser, generally of straight tube construction. The condensed water and turpentine are passed to a decanter, and the separated turpentine is withdrawn to storage. In some mills, the storage tank also serves as a decanter.

Digester Operation and Relief

The species of pine cooked is the first consideration and also the most important, as to net yield of turpentine. As might be expected, slash and longleaf pine, which are the principal species worked in the naval stores industry, provide the highest yield, according to the questionnaire returns. In terms of gallons of crude sulphate turpentine per ton of air-dry pine pulp, slash and longleaf pine yield 2.8 to 4.3 gallons; loblolly, shortleaf, and Virginia pine yield 1.5 to 2.7 gallons; jack and white pine yield 1.5 to 3.1 gallons.

Of the twenty-four mills reporting, three mills use indirect steam exclusively in cooking, and five others employ indirect steam in part. There is no apparent choice between the two types of steaming as to yield of turpentine.

Most mills begin the relief at the start of the cook, and continue it for the duration of the cook. In those mills in which the relief period is less than 60 minutes, the yield tends to be low. Not much information is available on the progressive rate of turpentine recovery during the sulphate cook, and this point was not included in the questionnaire. One mill, however, volunteered information which indicates that the peak of turpentine recovery occurs after the cook has proceeded for an hour. In this example, a total of 25 gallons of turpentine was recovered during the entire cook. Only 2 gallons were recovered in the first 60 minutes, during which time 100 pounds digester pressure was attained. In the second 60 minute period, 10 gallons were recovered, and in the third 60 minute period, 7 gallons were recoved. According to this observation, there is little benefit gained by beginning the relief before the digester is up to pressure, but once begun, relief should be continued to the end of the cook. It has been reported also that the color and odor of the turpentine deteriorate as the cook proceeds.

Most mills relieve through manually operated valves. Some mills also use an orifice in the order of $\frac{3}{16}$ to $\frac{5}{16}$ inches in diameter. There seems to be a trend in newer installations toward automatic relief and use

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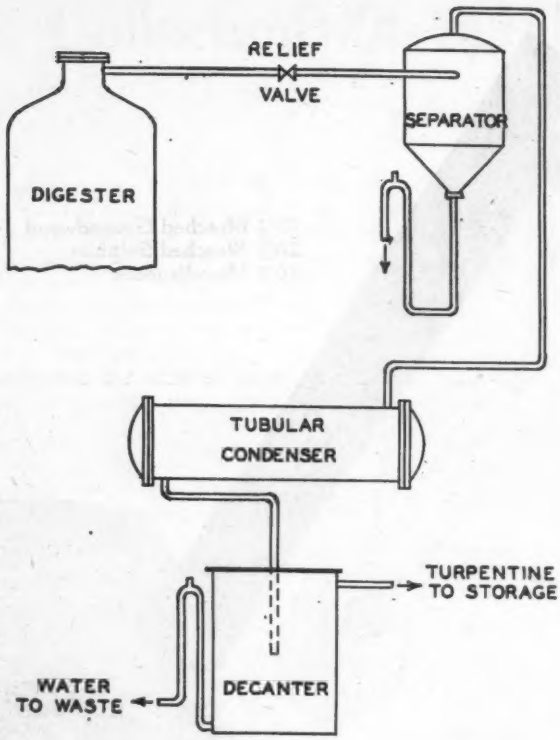

FIG. 2

of an orifice. These two factors can provide a considerable measure of insurance against careless, excessive relief, and consequent entrainment of black liquor in the relief. The size of relief valves and lines ranges from ½ to 4 inches, though mostly in the order of 1½ to 2 inches. The size of the relief line obviously should be related to the size of the digester. The relative yields tend to be low when the relief line is smaller than 1½ inches, but this correlation is not highly consistent.

The technique of relieving, particularly by hand, is important. As brought out by several mills, if not done carefully, this may well result in operating difficulties such as fouling of condenser tubes and formation of emulsions in the condensate.

Separator

The separator is usually located on or above the digester floor. The location is usually a matter of convenience, and safety is reported to be of no particular concern because the pressure prevailing in the separator is negligible. A safety valve occasionally is installed as an additional safeguard.

The dimensions of the separator were requested in the questionnaire, in hopes of shedding some light on emulsion difficulties. The separators are of such size that 1 to 10 gallons of turpentine per day in vapor form are passed per cubic foot of separator volume. This wide variation is further complicated by the variation in amount of water vapor which accompanies the turpentine. The size of the separator does not relate to emulsion difficulties reported by various mills. The use of two separators in series appears to be more effective than the use of a single, large separator. The installation of a second separator in series is reported by one mill to have definitely overcome emulsion troubles. Some mills employ a small separator on the individual digesters, followed by a larger separator for the combined relief.

Most separators have cone bottoms, and about half of them have annular gas baffles. The vapor inlet is in the order of 2 to 6 inches in diameter, the vapor outlet 3 to 10 inches, and the liquor draw-off at the bottom 1½ to 8 inches, usually 6 inches. In most installations, the entrapped liquor is discharged continuously through a liquid seal to blow pits or other

TABLE I.—COLLECTION OF SULPHATE TURPENTINE—SUMMARY OF RETURNS FROM TAPPI CHEMICAL PRODUCTS COMMITTEE QUESTIONNAIRE—OCTOBER, 1946

Mill Number	1	2	3	4	5	6	7	8	9	10	11	12
A. DIGESTER CONDITIONS:												
1. Type of pine cooked, by species:												
Jack, white, Canadian, %	100	100	100	100	....	....	....	....	....	....	....	....
Loblolly, shortleaf, Virginia, pond, %	....	....	....	....	100	100	100	100	100	....	75	35
Slash, longleaf, %	....	....	....	....	....	....	....	....	....	....	25	65
2. Steaming, direct or indirect	Both	D	Both	Both	I	D	D	D	D	D	D	D
B. DIGESTER RELIEF:												
1. Digester pressure when relief begins, lb.	0	40	0	40	20	50	0	30	25	0	0	40
2. Duration of relief, min.	60	30	30	DC	DC	DC	DC	DC	DC	DC	DC	60–70
3. Size valve or orifice, in.	2½	½	1	1½-V	1-V	2	2	1½	1½	2	3	2
C. SEPARATOR:												
1. Approx. volume, cu. ft.	130	10	32	75	32	315	225	125	1550	24	80	73
2. Gallons turpentine/day per cu. ft. separator vol.	1.3	10	5	....	20	1.9	0.9	....	0.06	....	5.8	10.6
D. CONDENSERS (Straight Tube):												
1. Number of condensers	1	1	....	1	1	8	2	4	1	2	2	4
2. Horizontal or vertical	V	V	....	H	H	H	V	H	H	H	H-V	H
3. Number of passes	1	1	....	4	4	2	1	2	3	2	1	2
4. Condensing surface, sq. ft. per gallon turpentine per day	5.8	3.2	....	....	0.9	....	11.2	....	8.6	....	3.0	1.0
5. Cooling water:												
a. Gallons/gal. turpentine	....	500	....	....	350	300	....	....	....	....	....	350
b. Temperature in, °F.	....	48	....	70	65	65	85	70	60	50–90	....	74
c. Temperature out, °F.	....	79	....	150	120	100	100	120	80	100–130	....	130
d. Thousand Btu./gal. turpentine	....	129	....	....	161	88	....	....	....	....	....	163
6. Condensate temperature, °F.	90	54–86	....	....	90	80	....	150	....	90–110	....	195
E. DECANTER:												
1. Separate decanter, or combined with storage	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	CS
2. Number of decanters	1	1	2	1	3	1	1	1	1	2	3	....
3. Continuous or intermittent	C	I	C	C	I	C	C	C	C	C	C-I	C
4. Turpentine per day per cu. ft. decanter volume, gal.	1.3	1.3	1.9	....	2.2	10.6	1.3	....	0 6	....	1.0	....
5. Crude turpentine collected:												
a. Gallons per day	165	100	150	....	600	600	200	....	100	....	815	....
b. Gallons per ton pine pulp	1.6	1.0	1.5	....	1.6–2.0	1.8	1.0	1.5–2.0	0.6	1.3	1.65	3.4
6. Water condensed per gallon turpentine, gal.	....	10	....	....	9	16	....	....	1.2	....	17	25
7. Trouble with emulsions	No	No	No	....	Yes	Slgt.	Yes	No	Yes	No	Yes	Slgt.
F. STORAGE:												
1. Above or below ground	A	A	B	A	A	A	A	A	A	B	B	A
2. Horizontal or vertical storage tank.	V	H	H	....	H	H	H	H	H	H	H	H-V
3. Pump or water displacement	P	WD	P	P	P	P	P	P	WD	WD	P	WD
4. Corrosion of storage tank observed	No	No	No	No	Some	Slgt.	Yes	Yes	....	No	No	No

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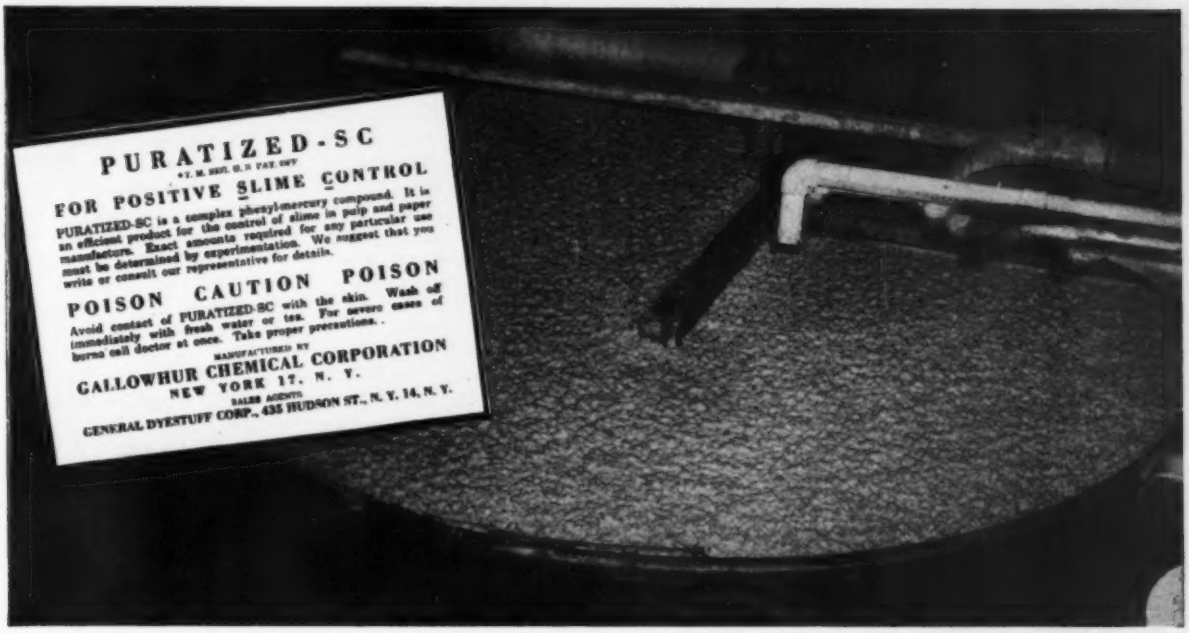
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salvage points. Liquid seals are feasible where the pressure is negligible.

There are two factors in separator design which obviously can affect turpentine yield. If the separator is operated intermittently and entrapped liquor flushed by a hand valve, there is danger of this valve being left open and turpentine vapor passed on to the blow pit. Secondly, if the separator is not insulated, and particularly if it is large, there is likelihood of turpentine condensing in the separator and passing off with the black liquor.

Condenser

Practically all mills employ straight tube condensers. One mill employs a coil condenser, and one uses a jet condenser. A straight tube condenser is preferred for ease of cleaning. The tubular condensers are about equally divided between horizontal and vertical types, and likewise divided between vapor tube and water tube styles. One mill reports that results were not satisfactory when turpentine vapors were on the outside of the tube, and the arrangement was changed to pass the vapors inside the tube. A multi-pass condenser seems definitely better than a single-pass, particularly where the condenser tubes are less than 10 feet in length. One mill reports changing to a 5-pass condenser because the 3-pass unit was not completely satisfactory. Digester heaters and evaporator bodies are sometimes used for condensers.

The condenser tubes are from 5 to 20 feet long, and usually 1 to 1½ inches in diameter. For materials of construction, seventeen mills report mild steel, six stainless steel, and one 5% nickel steel. The total condensing surface is usually in the order of 1 to 5 square feet per gallon of turpentine recovered per day, although a few range between 5 and 10 square feet. There was no correlation between condenser capacity and yield, although again the amount of water vapor is a complicating factor. The amount of condenser cooling water is usually in the order of 300 to 700 gallons of water per gallon of turpentine. The condenser cooling water is discharged at 100 to 150°F. The cooling water leaving the condenser is frequently used for pulp washing and similar applications where the temperature and volume are not critical, so that the usual practice is merely to employ a safe excess. The heat extracted in the condenser is in the general range of 75,000 to 175,000 B.t.u. per gallon of turpentine. The condensed turpentine and water mixture is usually discharged from the condenser at 90 to 110°F., although in some mills, it is discharged at 150 to 190°F. The temperature at which the turpentine is discharged shows no definite relationship to yield, emulsion problems, or corrosion of storage vessels.

The amount of water vapor which is relieved along with the turpentine usually exceeds by far the theoretical amount required for steam distillation of turpentine, which is only about 0.65 gallons of water per gallon of turpentine. In condensing this mixture, water alone theoretically will be condensed until the partial pressure of turpentine builds up to the point where it satisfies the partial pressure relationship for this equilibrium mixture. This corresponds to a partial pressure of turpentine vapor of 115 mm. at 96°C. The significance of this is that 90% or more of the water vapor in the relief will condense before the turpentine begins to condense. If a condenser is undersized by only a slight margin, therefore, a serious penalty in turpentine yield may occur. The same is true if the condenser is of ample size, but has its efficiency impaired by fouled tubes. Completeness of turpentine condensation fortunately can be determined readily by checking the vented vapor for turpentine content.

Decanter

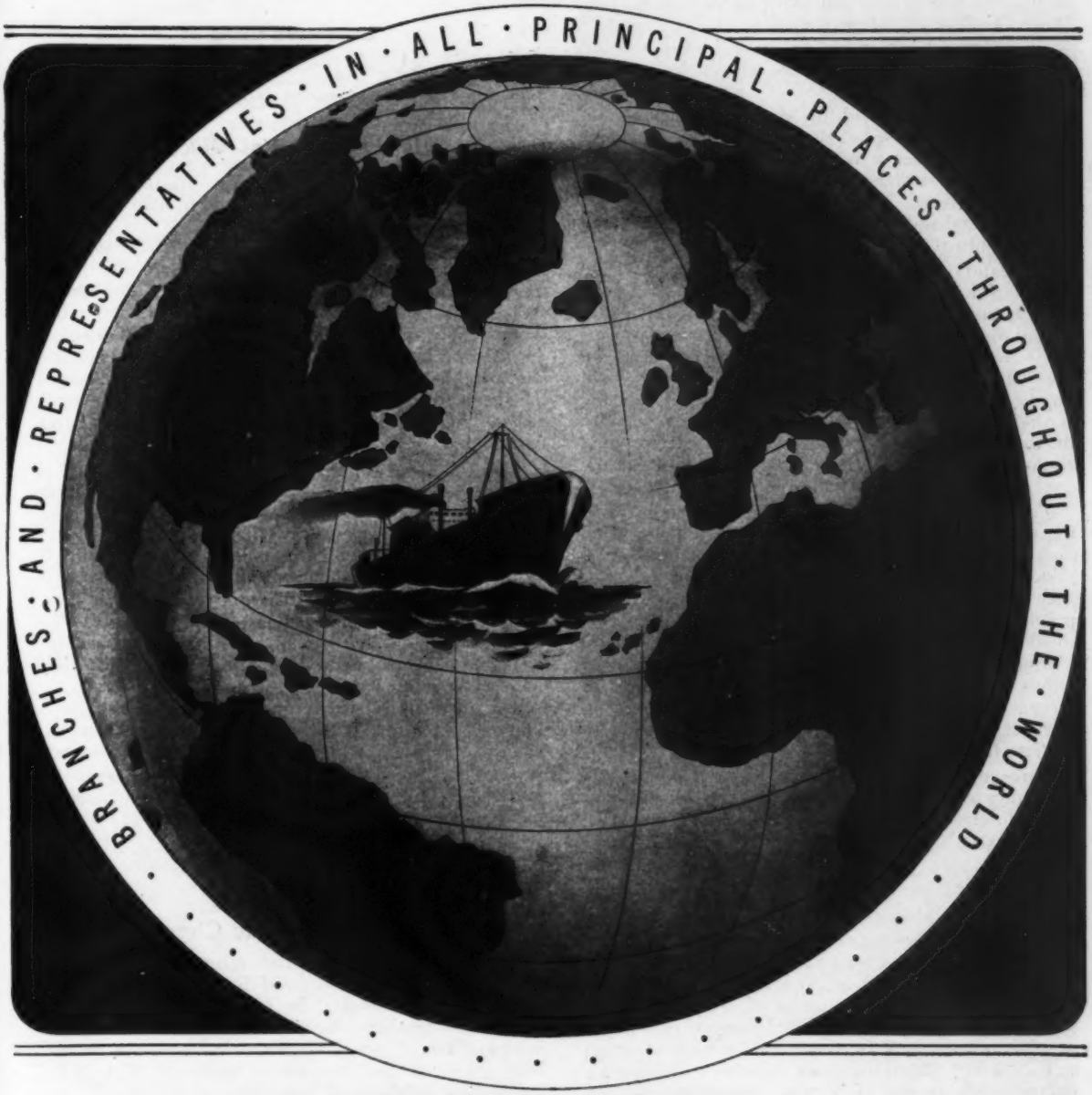
Three mills use their storage tank as a decanter. The others report using one or more separate decanter

TABLE I.—*Continued*

Mill Number	13	14	15	16	17	18	19	20	21	22	23	24
A. DIGESTER CONDITIONS:												
1. Type of pine cooked, by species:												
Jack, white, Canadian, %	....	....	....	....	....	....	100	....	....	....	....	....
Loblolly, shortleaf, Virginia, pond, %	....	20	....	100	100	100	....	90	100	80	45	80
Slash, longleaf, %	....	80	100	....	....	....	....	10	....	20	55	20
2. Steaming, direct or indirect	D	D	D	D	I	D	Both	D	D	Both	I	D
B. DIGESTER RELIEF:												
1. Digester pressure when relief begins, lb.	0	0	0	0	0	0	5	0	0	45	0	25
2. Duration of relief, min.	DC	DC	DC	DC	DC	DC	DC	DC	DC	90	0	45
3. Size valve or orifice, in.	1½	2	1	2	I-V	1½	4	1½	1	2	2	2
C. SEPARATOR:												
1. Approx. volume, cu. ft.	35	75	300	200	34	105	70	210	170	7	204	220
2. Gallons turpentine/day per cu. ft. separator vol.	8.6	10.7	2.5	2.1	18	6	4.3	0 5	2.0	128	3.2	2.3
D. CONDENSERS (Straight Tube):												
1. Number of condensers	2	1	2	1	3	1	1	1	1	2	1	1
2. Horizontal or vertical	V	H	V	V	H-V	....	H	H	H	V	V	Jet
3. Number of passes	1	4	2–4	1	1	1	2	1+	4	1	2	....
4. Condensing surface, sq. ft. per gallon turpentine per day	7.0	0.5	2.2	3.8	0.9	1.1	....	7 4	1.2	1.0	1.6	....
5. Cooling water:												
a. Gallons/gal. turpentine	600	....	....	....	....	760	....	820	360	....	300	....
b. Temperature in, °F.	78	85	75	80	85	85	50	80	76	75	82	....
c. Temperature out, °F.	110–120	120	85	105	....	135	70	103	125	100	110	....
d. Thousand Btu./gal. turpentine	185	....	....	....	....	317	....	157	147	....	70	....
6. Condensate temperature, °F.	110	150	91	95–170	100	147	....	190–205	100–120	120	100	....
E. DECANTER:												
1. Separate decanter, or combined with storage	CS	SD	SD	CS	SD	SD	SD	SD	SD	SD	SD	SD
2. Number of decanters	....	1	1	....	2	1	1	1	1	1	1	1
3. Continuous or intermittent	....	C	C	C	I	C	C	C	C	C	C	I
4. Turpentine per day per cu. ft. decanter volume, gal.	....	6.3	3.9	....	1.9	1.8	2.6	0.2	2.4	....	8.3	1.1
5. Crude turpentine collected:												
a. Gallons per day	300	800	760	425	600	620	300	105	300–400	900	660	500
b. Gallons per ton pine pulp	2.5	4.3	2.8	1.6	1.75	2.2	3.1	0.5–1.5	2 7	2.5	3.0	1.0
6. Water condensed per gallon turpentine, gal.	....	1.7	84	24	....	29	....	58	....	....	....	....
7. Trouble with emulsions	Yes	No	No	No	Rare	No	Yes	Yes	No	No	No	No
F. STORAGE:												
1. Above or below ground	A	A	A	A	A	A	A	B	A	A	A	B
2. Horizontal or vertical storage tank	H	....	V	H	H	H	H	H	H-V	H	H	H
3. Pump or water displacement	WD	P	P	WD	P	WD	P	P	P	WD	P	P
4. Corrosion of storage tank observed	No	No	Yes	No	No	No	No	No	No	No	Yes	Slgt.

Note: Item B2, DC = Duration of cook.

WOODPULP AGENTS
PAPER EXPORTERS



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tanks, usually with a closed, but vented top. They vary in size, but average about 4 feet in diameter and 8 feet high. The turpentine take-off at the top of the tank is about 2 inches in diameter, and a water take-off approximating 4 inches is located at or near the bottom. The water take-off rises outside the tank and overflows 2 to 3 inches below the turpentine outflow. Nineteen mills operate their decanter continuously, and five intermittently. The decanter tanks are made of mild or galvanized steel. The size is such that most of them handle 1 to 5 gallons of turpentine per day per cubic foot of decanter volume. A few handle 5 to 10 gallons of turpentine per cubic foot of volume. The size of decanter shows no relation to emulsion problems.

Only twelve mills had any data on the amount of water vapor condensed along with the turpentine. The results varied over a very wide range, from 1.2 to 84 gallons of water condensed per gallon of turpentine recovered. No close relation between turpentine yield and water ratio was noted. A heavy relief does not insure a high yield of turpentine.

The ratio of water to turpentine in the relief varies rather widely during the cook, according to such information as is available. The same mill which submitted the figures previously mentioned on turpentine yield at various stages of the cook also reported on the water to turpentine volume ratio during the cook. It was 50:1 in the first hour of the cook, 2:1 in the second hour of the cook, and 9:1 in the remainder of the cook. In this instance, the cumulative total showed 9 gallons of water per gallon of turpentine over the entire period of the cook.

Ten mills reported troubles with emulsions in varying degree. This is due to carry-over of foam, black liquor, and fiber into the condensing and separating system. This difficulty may be prevented in large degree by greater care in relieving the digester. As previously mentioned, one mill reported overcoming the difficulty by installing a second separator in series. Various remedies for breaking up the emulsion, once it has formed, are given as follows: turn water in on top, decant emulsion and heat with live steam, salt out with white liquor, add acid to emulsion in storage tank.

Three mills put their separated water condensate through a save-all before discarding, which provides an additional safeguard against loss of turpentine through emulsification.

Storage

Nineteen mills store their crude turpentine above ground, and five below ground. Horizonal, rather than vertical, storage tanks are employed in most instances. Mild steel construction is employed, and the use of old digesters for storage tanks is mentioned. Turpentine is removed from storage by means of a pump in sixteen mills, and by displacement with water in eight. Safety precautions are observed in varying degree, such as use of a vent surmounted with a flame arrester, a gooseneck vent high in the air, and a dike surrounding the storage tank.

Seven mills report definite corrosion problems. Corrosion is generally observed in the vapor space above the turpentine, and is blamed on volatile sulphur compounds. It is likely that this corrosion problem is more universal than indicated. Several returns came from mills which have relatively new installations and have not had opportunity to gain experience as to corrosion. In other instances, particularly in the case of underground storage tanks, it is possible that some corrosion has occurred without being observed. None of the operating conditions covered in the questionnaire seem to have any bearing on the corrosion problem.

Acknowledgment

Acknowledgement is made to the twenty-four mills for their liberal co-operation in contributing data for this survey.

Literature Cited

1. U. S. Dept. of Agriculture, Agricultural Research Administration, Bureau of Agricultural and Industrial Chemistry, "1945-46 Annual Naval Stores Report on Production, Distribution, Consumption and Stocks of Turpentine and Rosin of the United States."

Disintegration of Viscose

Papers treated with viscose are difficult to disintegrate by the usual procedures used in fiber analysis. In searching for an improved method, the authors noted a paper by A. Weber [*Chem. Weekblad* 33: 125-126 (1936)], in which the disintegration of filter papers in hot calcium nitrate solution was described. When this method was applied to papers containing viscose, it was found that the paper rapidly disintegrated into individual fibers. The procedure is simple and quickly performed, and has been successfully applied in this laboratory over a period of several years. The subsequent stain reactions of the fibers are not altered.

The following procedure is recommended:

The paper is torn into small pieces, placed in a beaker containing a 50% calcium nitrate solution, and heated to just below boiling until the paper begins to disintegrate. The sample is removed, rinsed in distilled water, and then disintegrated in the usual way by boiling in 0.5% sodium hydroxide solution, washing with distilled water, treating with 0.2% hydrochloric acid at room temperature, again rinsing well, and defibering by rolling into pellets and shaking with water in an Erlenmyer flask.

The method has been tested on two papers containing different synthetic resins as wet-strength agents. Although some improvement in defibering was noted, the papers were not sufficiently disintegrated for fiber analysis. Hence, the calcium nitrate method does not appear to be generally applicable to the disintegration of wet-strength papers.

B. L. Browning and John H. Graff, The Institute of Paper Chemistry, Appleton, Wis.

New Text on Organic Chemistry

Interscience Publishers has recently published a new book on "Mechanisms of Reactions at Carbon-Carbon Double Bonds," by Charles C. Price, Professor of Chemistry, University of Notre Dame. It is one of the series of lectures on progress in chemistry given at the Institute of Polymer Research, Polytechnic Institute of Brooklyn.

Among the subjects covered are: electronic structure of unsaturated organic molecules; ionic reactions involving double bonds; free radical reactions involving double bonds; free radical addition polymerization; copolymerization; emulsion and suspension polymerization, and polar polymerization.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $2.50 per copy.

NEW improvements step-up SPEED, ACCURACY, CONTROL in this 2-wheel swing-rest grinder

Farrel design attacks roll maintenance costs again. While the exclusive swing-rest principle, with the use of two large diameter grinding wheels, is still No. 1 feature, these new improvements in the well-known Farrel two-wheel roll grinder contribute importantly to faster grinding, finer finish and closer control of roll accuracy:

1. Modern electrical control provides proper speed for any required finish. Headstock drive has 4:1 speed range, grinding wheels 2:1, carriage 20:1.

2. V-belt wheel drives are mounted directly on carriage, eliminating possibility of vibration from superstructure and facilitating placement and removal of rolls.

3. New wheelhead design permits changing wheels without disturbing either spindles or bearings. Spindles are large diameter to assure rigidity; bearings have adjustments for control of running clearance.

4. Electronic control of carriage drive gives stepless, wide-range speed variation without gears or clutches.

5. A triple reduction headstock drive, with V belts and precision generated double helical gearing, provides smooth, vibrationless rotation of the roll.

This new grinder also has automatic crowning and concaving device, inverted V ways and other Farrel design features with proven performance efficiency. Complete information will be furnished on request, without obligation. FB-367

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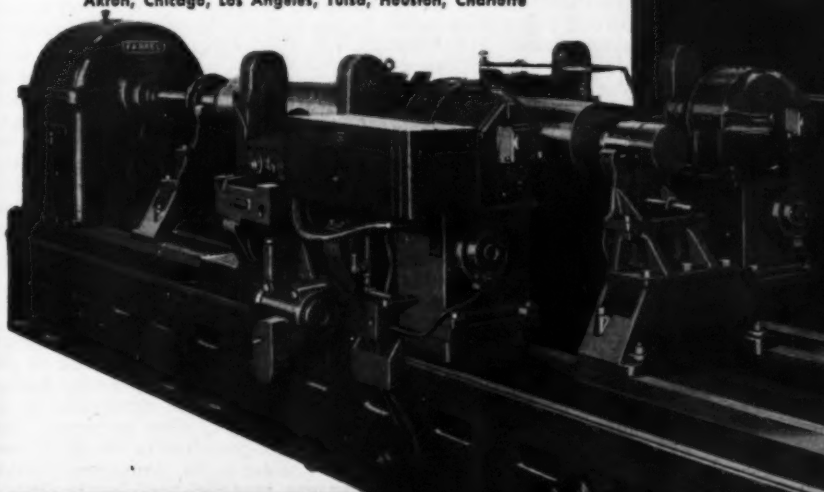
End view showing the new grinder with overhead wheel drive eliminated.

Close-up of grinding wheel head showing crowning device and change gears.



The new Farrel swing-rest roll grinder is made in two sizes for roll diameters up to 32" and 42", any length required.

Farrel-Birmingham

Sutherland Elects Race As President

KALAMAZOO—William Race was elevated to the presidency of the Sutherland Paper Company at the annual meeting. Race has been connected with Sutherland since 1934, becoming Treaurer in 1936. He has held the combined offices of Secretary and Treasurer since 1939. In addition to his industrial interests, Race is active in civic affairs. L. W. Sutherland remains as chairman of the Board.

Richard F. Neff, Sr. was elected vice-president in charge of sales. Thoroughly familiar with paperboard and its conversion, Neff has served as general sales manager since 1942. He joined the company as sales representative in 1934.

A. L. Sherwood, who has been technical advisor since 1936, takes the post of vice-president in charge of engineering. Sherwood, who is active in TAPPI and other technical groups, will also continue as technical director.

G. E. Graham continues as vice-president in charge of production, an office he has held since 1940.

E. Wendell Smith will be the new secretary. Smith joined Sutherland in 1946 as controller after ten years with a prominent firm of New York auditors where he became a principal. He will continue as controller.

L. W. Sutherland, Jr. was advanced to treasurer. Sutherland joined the company in 1938. He enlisted in the United States Navy in 1941 and served fifty-two months, attaining the rank of Chief Quartermaster.

Harry C. Harvey becomes assistant secretary. He joined the company in 1928 as cost accountant, and is the manager of the cost department.

C. W. Lawrence was elected assistant treasurer. Auditor since 1936, he has been connected with the company since 1925.

The expansion program announced last year has been proceeding at a steady pace and is nearing completion. The new units will enable Sutherland to increase both its paperboard production and its conversion operations.

Tinker Weighs Facts Before Paper Men

(Continued from page 44)

taining new equipment, I am sure these difficulties will be temporary and that paper machine capacity will not long be a limiting factor on production to meet any demand, both domestic and foreign, that offers an economic market for the industry.

I would now like to ask your consideration of the fundamental problem that will limit the growth of the pulp and paper industry in the United States, providing it is not recognized and acted upon by the industry. It is a problem affecting with equal force both integrated and non-integrated mills and is particularly of grave concern when we consider the available

E. W. TINKER

supply of market pulp. Bearing on this question is the large tonnage being diverted from paper grades of pulp to high alpha grades. The extent of this diversion in both domestic and foreign market mills is a vital issue to converting mills right now. This whole question has many ramifications but there are certain major elements that justify your immediate concern. Let me say that, as with paper production, I haven't the slightest doubt of the aggressiveness of the industry in installing new digesters providing there is reasonable assurance of a permanent supply of raw material in the form of wood to operate them.

Basically the limiting factor on the growth of the pulp and paper industry revolves around the problem of future wood supply about which there is a great deal of misconception. Recent figures, made available by the Forest Service, indicate that pulpwood growth and drain are approximately in balance if considered from a national standpoint. To me this means little because the wood must be economically accessible to pulp mill operations before it becomes a real factor. There are just two unexplored reservoirs of supply of pulping species, both in the main within established national forests. There is an enormous stand of Engleman spruce, a high elevation species, that is indigenous to the Continental Divide from Idaho to New Mexico. Under the administration of the Forest Service, I think it can be taken for granted that these stands will only be developed on a sustained yield basis permitting permanent operations. No doubt they would have long since been opened by pulp mills except for the fact that it is a region of shortages of water. The other great reservoir, which is subject to much current discussion, is that existing in Alaska. In this region again there is little doubt but that this supply of timber would have been opened up except for two factors. The first is purely an economic one, involving the large capital investments that would be required, and the extremely high cost of labor and operation in that territory. The other, the unsatisfactory contract terms under which the timber is offered for sale.

It is probable that these two great reservoirs of supply of wood will be developed if the situation becomes acute enough.

There exists in the United States some three hundred and thirty million acres of so-called commercial forest land. On the basis of the present consumption of pulpwood available from domestic sources, not over forty million acres would be required to bring growth and drain into balance. Official figures indicate that some 14,800,000 acres are now owned by paper and pulp companies. Of this acreage some 82% is classified as being under reasonable satisfactory forest management. The tremendous acreage that is being acquired by companies within the industry is indicative of the interest and appreciation of management of the importance of future wood supplies.

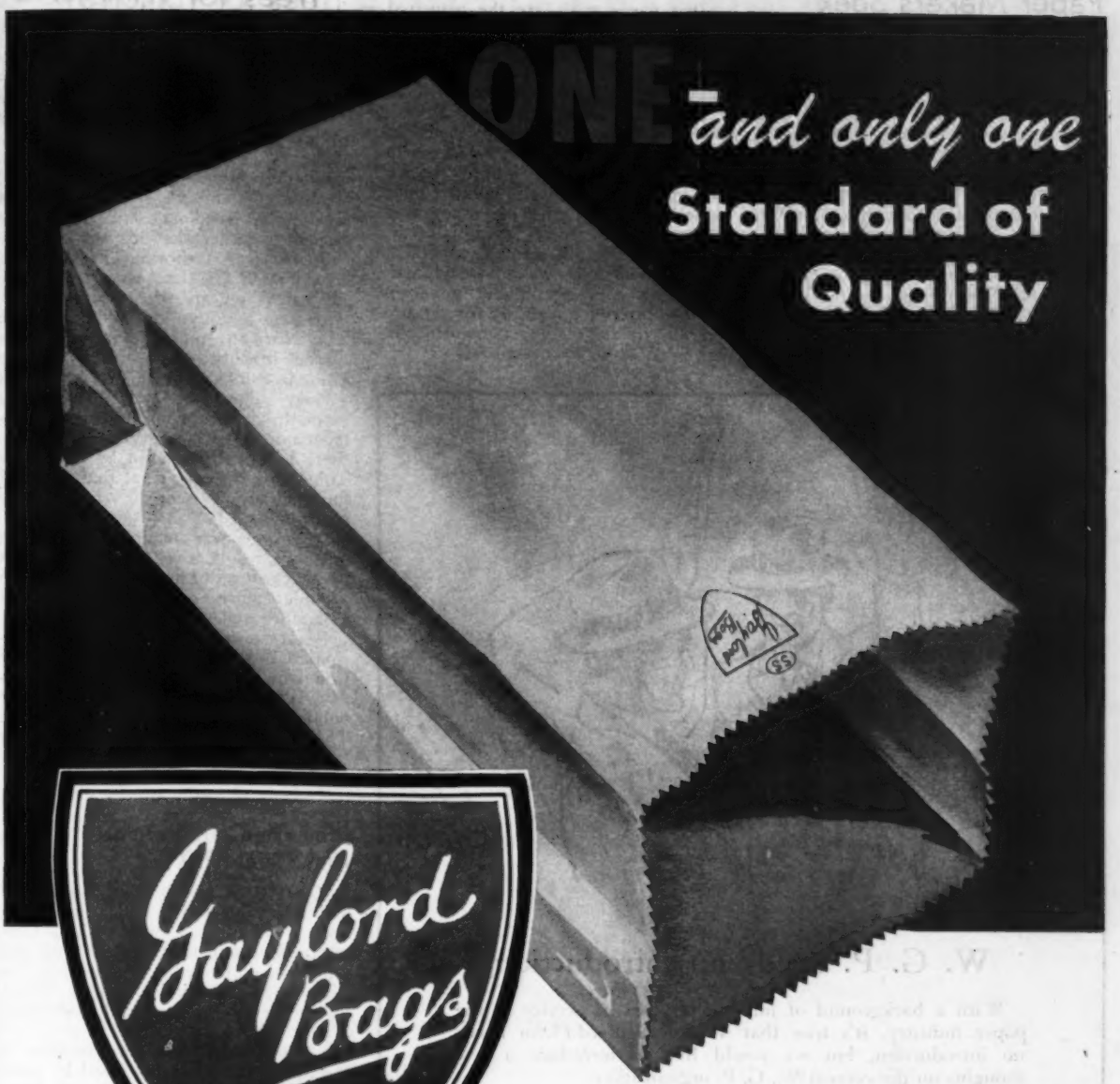
Pulpwood forestry has now become an economic enterprise. It is in its infancy in the industry but with the increasing number of planned projects exemplified in progressive companies, I am sure that properly engineered forestry undertakings will become more and more common and with more general acceptance, pulpwood supplies will cease to become a problem although they will remain an economic necessity.

In conclusion, let me say that to the best of our knowledge, based on information available to us, the problems of pulpwood supplies impose definite limitations upon the expansion of the paper industry in all foreign countries.

It is indeed encouraging to see, with the exception of Russia, including Canada, the tremendous strides that are being taken by the paper industry in meeting this basic obstacle to its expansion. We have the required forest land and it is to me axiomatic that private effort will solve the problem.

Ditto Names Three to Vice-Presidencies

CHICAGO—Three new vice-presidents have been named by the board of directors of Ditto, Incorporated, during the past week. The three are R. J. Kirkpatrick, Jr., sales manager, who now is vice-president in charge of domestic sales; G. M. Armstrong, works manager, now vice-president in charge of manufacturing; and H. E. Horn, export manager, who has been appointed vice-president in charge of all foreign sales. All will have their headquarters in the Chicago office of Ditto, Inc.



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Paper Makers Seek Cutting Control Law

MADISON, Wis.—"We know the future of our business is tied up with the future of the forests," J. O. Miller, Neenah, representing Kimberly-Clark Corporation, told the Wisconsin senate's agriculture and conservation committee February 19, in supporting the Wisconsin Conservation Commission's proposal for a state timber cutting control law. Mr. Miller said that paper manufacturers of the Fox River Valley want the law passed.

The measure is seen as helping assure a future supply of raw materials for the mills. Mr. Miller pointed out that paper mills are the principal industries in Menasha, Neenah, Kaukauna, Little Chute, Kimberly and De-Pere, and that they are of great importance in Green Bay and Appleton.

Paper manufacturers in the Wisconsin River Valley have been the earliest and strongest supporters of the proposed legislation. Those of the Fox Valley have heretofore taken a more passive attitude, although they have favored the proposed legislation.

Under the bill the Conservation Commission and an advisory body, with the consent of the governor, would prescribe standards for the prevention of harvesting immature timber in Wisconsin forests.

W. G. P. needs no introduction

With a background of ninety-one years of service to the paper industry, it's true that Walker-Goulard-Plehn needs no introduction, but we would like to introduce a few thoughts on the current W. G. P. organization.

Actually, Walker-Goulard-Plehn works as a team. The three principals with their wealth of experience and paper "know how" are the nucleus of this well-balanced team of paper merchants. Add to this a group of specialists each with many years experience in his specific field, and you have a combination that's hard to beat. If you're looking for an aggressive, heads-up organization as your distributor on paper and board products, call on Walker-Goulard-Plehn.

W.G.P.

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Trees for Tomorrow Offers Seedlings

MERRILL, Wis.—Six hundred thousand seedlings will be made available to tree planters in the Wisconsin river valley by Trees for Tomorrow, Inc., under its "2 for 1" reforestation plan. The offer is intended to enable land owners to continue replanting forest land and woodlots, and to induce others to undertake this work.

Because of a shortage of seedlings, two instead of three species will be offered. They are three-year-old Norway pine and two-year-old jack pine. The Norway stock, having been declared surplus, will come from the United States Forest Service next spring. The trees will be routed through a state conservation department nursery, whose staff will package them before distribution by Trees for Tomorrow, which was founded and financed by Wisconsin river valley paper mills.

A survey was made last summer, and as a result, a set of standards has been drawn up to help tree planters, to provide more on-the-field technical assistance and pre-planting plans.

Reforestation operations by the Consolidated Water Power and Paper Company were described in the February issue of "Tree Tips," monthly publication of Trees for Tomorrow. The article describes the company's holdings and activities in Forest County.

Kimberly-Clark Installs Dial System PBX

NEENAH, Wis.—Two new subsidiary and unattended dial PBX units have been installed by Kimberly-Clark Corporation, completing an enlarged and improved dial telephone system at the Lakeview and Kimlark mills. Work on the system was started more than a year ago.

Seven hundred or more stations in the improved system are used by more than five thousand employes at Kimberly, Badger-Globe and Lakeview mills, as well as the Kimlark plant, research laboratories and main office. Two switchboards, four associated dial switching units, 57 central office trunks, 29 tie trunks and 12 lines to other exchanges are included.

It is the most complex PBX system in the Wisconsin Telephone Company and the largest dial system in the state outside of Milwaukee, according to R. P. Brooks, manager of the telephone company at Neenah.

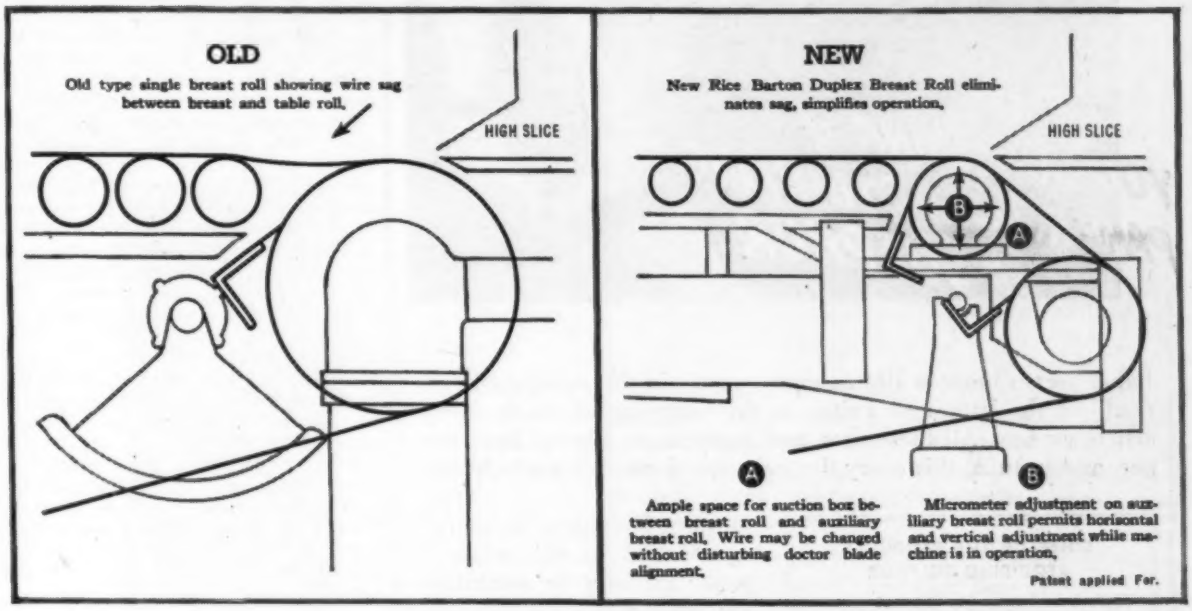
The new system has a tandem tie trunk arrangement which permits any station to dial any other station in the network, regardless of location, through the central office, yet without the help of a telephone operator.

This permits the operators at the home office to be free to accept incoming local calls and take care of numerous incoming and outgoing long distance calls.

NEW RICE BARTON

Duplex Breast Roll

gives greater control of sheet formation

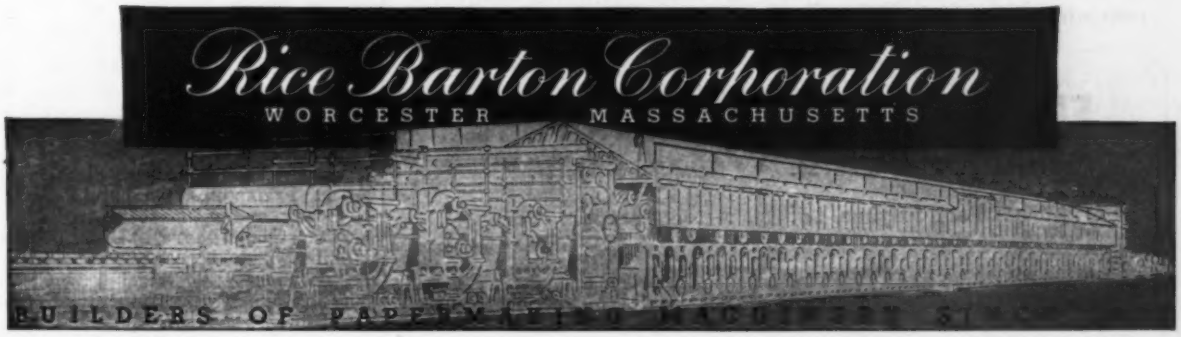

OLD
Old type single breast roll showing wire sag between breast and table roll.
HIGH SLICE
NEW
New Rice Barton Duplex Breast Roll eliminates sag, simplifies operation.
HIGH SLICE
B
A
A
B
Ample space for suction box between breast roll and auxiliary breast roll. Wire may be changed without disturbing doctor blade alignment.
Micrometer adjustment on auxiliary breast roll permits horisontal and vertical adjustment while machine is in operation.
Patent applied For.

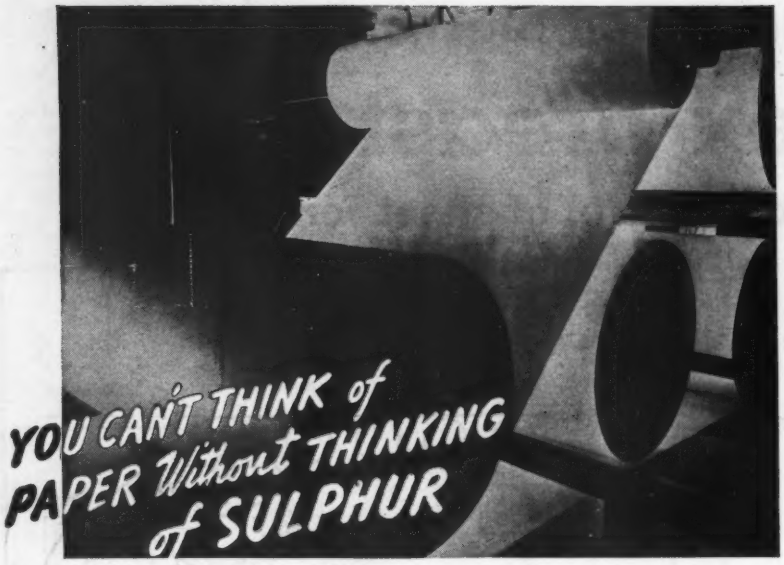
Longer wire life . . . better control of sheet formation . . . simplification of operation, are only a few of the advantages of the new Rice Barton Duplex Breast Roll.

Designed by Rice Barton engineers to reduce span between breast roll and the first table roll, without wearing drag of forming board, and at the same time reducing wire deflection at this point.

Check the explanatory diagrams . . . see how this level run of wire prevents the stock from running out at the edges . . . note the elimination of cross shaft, gears, etc. . . . and the horizontal and vertical adjustments that can be made with the machine in operation.

Write for further information





Paper serves modern life in many ways—in the newspapers we read—in the letters we write—in the wrapping of nearly every article we buy. All these uses, and many more, depend upon paper, and in turn, this every day necessity depends upon Sulphur.

SOME OF THE PRODUCTS REQUIRING SULPHUR

ACIDS	LUBRICANTS
CHEMICALS	MATCHES
CLEANING FLUIDS	MEDICINE
DRUGS	PAINTS
DYESTUFFS	PAPER
EXPLOSIVES	PETROLEUM PRODUCTS
FABRICS	PLASTICS
FERTILIZERS	PROCESSED FOODS
FILM	REFINED METALS
FOOD PRESERVATIVES	REFRIGERANTS
FUMIGANTS	RESINS
FUNGICIDES	RUBBER
GASOLINE	SYNTHETIC RUBBER
GLASS	SOAP
GLUE	SODA
GLYCERIN	SOLVENTS
INSECTICIDES	STEEL
KEROSENE	SUGAR
LEATHER	TEXTILES

Sulphur Dioxide is the active agent used in the sulphite paper industry to solubilize the undesirable constituents in the pulp wood effecting their removal from cellulose. Salt cake, a byproduct from the reaction of sulphuric acid and salt, and synthetic salt cake, made from Sulphur and soda ash, are used in the craft paper industry. Finally, compounds of Sulphur are used in the pigments and finishing agents to impart desirable characteristics to high-grade paper.

Freeport Sulphur Company has an ample supply of this vital mineral, so essential to industry. This stock combined with underground reserves and modern mining methods assures a continuing supply.

FREEPORT SULPHUR COMPANY

Offices: 122 E. 42nd St. • New York 17, N. Y.

Mines: Port Sulphur, La. • Freeport, Tex.

SULPHUR SERVES INDUSTRY

Writing Paper Group Holds Busy Session

(Continued from page 45)

Bruce Crane, vice-president of Crane & Company, Dalton, Mass., was re-elected chairman of the Thin Paper Group of the Writing Paper Manufacturers Association, at its Annual Meeting in New York City, February 24, 1947. The Thin Paper Group is composed of manufacturers of cigarette, condenser, carbonizing and other fine thin papers. E. G. Amos of the American Paper & Pulp Association addressed the group on labor conditions in the pulp and paper industry.

Commenting on strikes, Mr. Amos said: "The record for the paper industry is extremely interesting and exemplary. Not over a half-dozen strikes, all local were of consequence in the 12 months following V-J. Day and a minimum amount of time was lost due to strikes in that period. The reasons for this are obvious. The Paper and Pulp Industry pays good wages, affords steady work, has no industry-wide agreement, and further than that, the bulk of the industry has contracts with unions that are sincere in their desire to work and produce, rather than strike.

"With an adequate labor supply assured, according to the United States Labor Department, we have reason to believe the paper industry will experience very little trouble insofar as Industrial Relations are concerned in the paper industry during 1937."

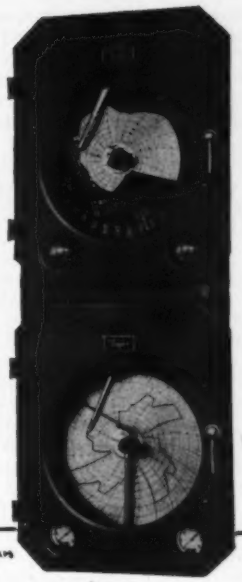
R. H. Morrill, vice-president and general manager of Chemical Paper Manufacturing Company and M. A. Park, vice-president of Marvellum Company were re-elected chairman and vice-chairman respectively of the Cover and Text Paper Group, Writing Paper Manufacturers Association, at its meeting held in New York, February 26, 1947. In addition, the following were elected to the Executive Committee of the Group: J. H. Dunton, W. C. Hamilton & Sons; H. T. Johnson, Mohawk Paper Mills and D. L. Quirk, Jr., Peninsular Paper Company.

Pierre J. Landry, European Representative of the U. S. Pulp Producers Association, recently returned from Europe, addressed the Group on "The Pulp Situation in Sweden."

Kendall Wyman, Champion Paper & Fiber Company was elected chairman of the Bristol Board Group, Writing Paper Manufacturers Association at its Annual Meeting held in New York, February 25, 1947. Mr. Wyman succeeds Norman Harrower, president of Linton Brothers & Company, Fitchburg, Mass.

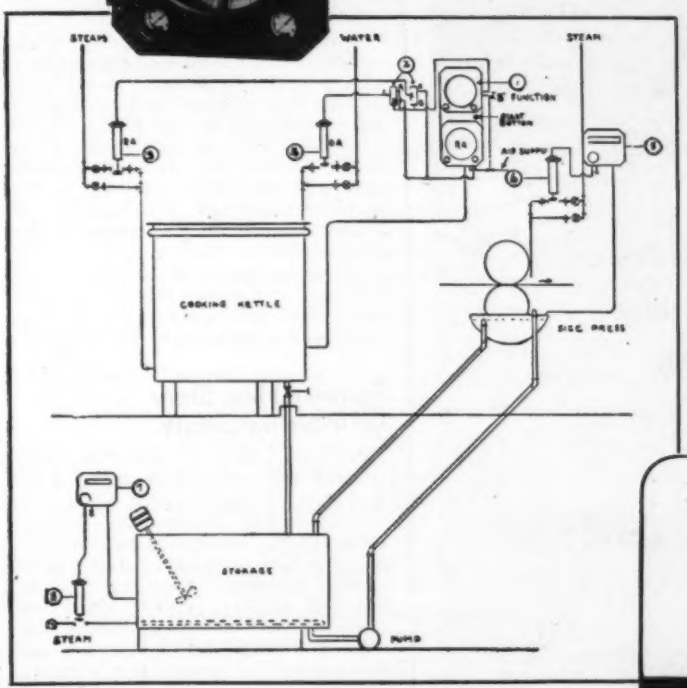
In addition to Mr. Wyman, the following were elected: as vice-chairman, A. E. Frampton, Hammermill Paper Company, and as members of the Executive Committee: J. J. D. Cowie, Hollingsworth & Whitney Company; H. A. Stone, Jr., Reigel Paper Corporation and Norman Harrower, Linton Brothers & Company.

STARCH PROBLEMS?



NOT IF you have a Taylor Fulscope Time Schedule Controller! With one of these versatile instruments running your starch cooking process automatically, the starch mix will turn out neither too thick nor too thin. The Fulscope holds it to a precise time and temperature schedule, and insures perfect cooking of every batch. The size comes out of the cooking kettle at just the right viscosity required for uniform application to the sheet.

All the operator has to do is to determine the ideal cooking schedule, set the cams and push a button! The Time Schedule Controller does the rest! And it repeats your schedule faithfully time after time. That's why this Taylor Instrument is standard in so many pulp and paper mills and laboratories.



Here are typical comments from paper mill superintendents: "*More uniform application of the starch to the product, tending to give a more uniform finished sheet.*" "Improved uniformity of weight of paper." "*Continuous repetition of a desired result.*" "Allows use of formulas balanced to the uniform amount of material to accomplish the results desired." "*More uniformity of cooking temperature.*" "More uniform size solution."

Now is the time to let Taylor Accuracy help *you* beat rising costs! When ordering processing equipment, specify "Taylor-Equipped as usual!" Ask your Taylor Field Engineer or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.*

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

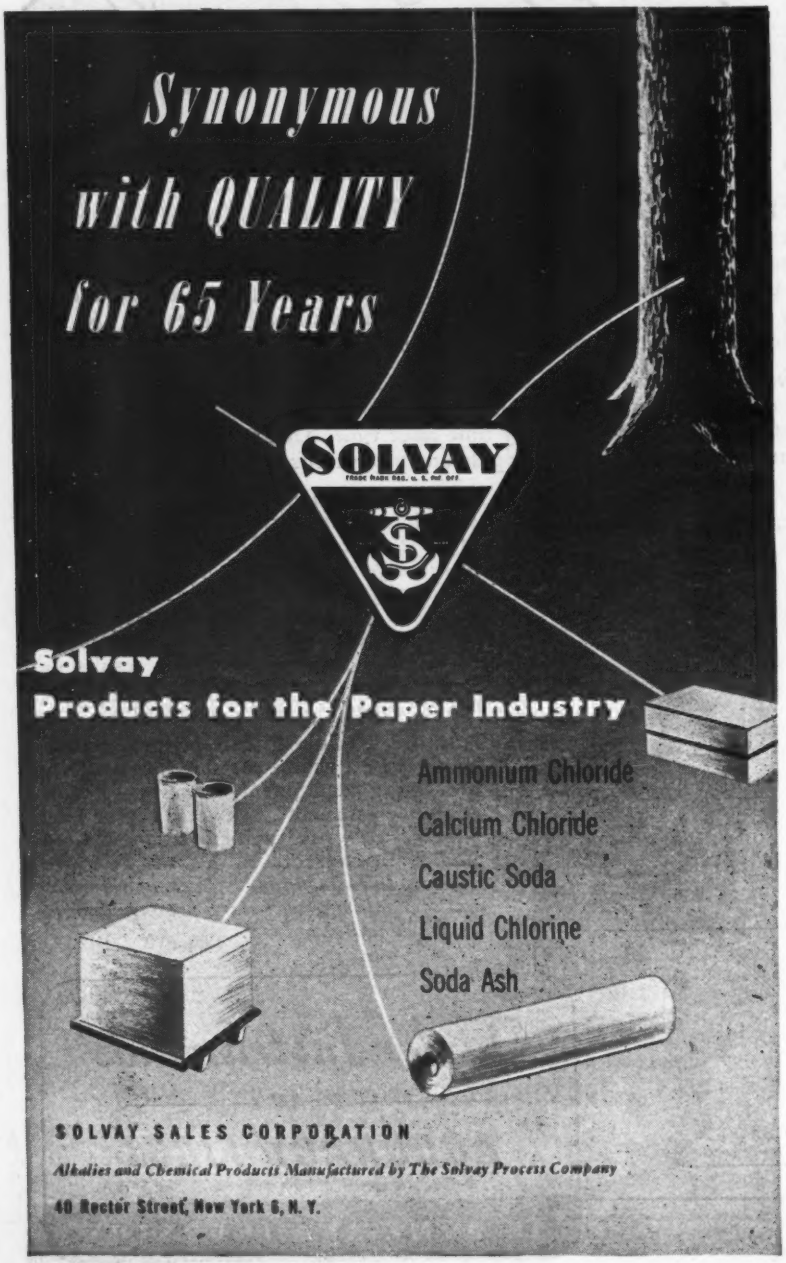
Imports Pass Under Customs Scrutiny

NEW YORK—Customs officials nave taken action on a number of pending problems involving imports, according to Warren B. Bullock, Manager of the Import Committee of the American Paper Industry. His report also shows that imports of various papers increased rapidly during 1946. Book and groundwood printing papers led the list with 81,000 tons imported as compared with 30,000 tons in 1945, and 9,000 tons in 1938, before the reduction of duty through a reciprocal trade agreement with Canada. Kraft paper shipments from Finland rose to 7,500 tons in 1946, as against 750 tons in 1945, and imports of tissue paper doubled. Considerable quantities of basic photographic paper and baryta coated paper for photographic use have increased sharply.

Special cases decided by Customs officials follow: Powdered alpha pulp was held to be dutiable as a manufacture of pulp, and dutiable, not duty free as pulp as claimed by a Philadelphia importer; Lampshade parchment imported at Philadelphia was held to be dutiable at 2 cents per pound and 10 percent as vegetable parchment, and not admitted at 10 percent as paperboard; Duplicator paper from Canada was held to be dutiable as writing paper at 3 cents per pound and 15 percent, not as printing paper at one-fifth of 1 cent per pound and 5 percent as printing paper, the claim of the importer; Corrugated paperboard, scored for folding, was classified as a manufacture of paper dutiable at 35 percent, and not, as claimed as container board at 20 percent; Blanks for jacquard board was classified at 35 percent as manufactures of paperboard, and not admitted as paper board at 10 percent as claimed by the importer; Paperboard from Canada, claimed to be dutiable at 10 percent as plain board, was classified as vat-lined board at a higher rate; Screening paper for case lining, imported from Canada was classified at 30 percent as paper not specially provided for, and not admitted as wrapping paper at 25 percent; Novel news from Canada was classified as printing paper, and not at the higher rate for cover paper; Airmail envelopes from Cuba were classified at 30 cents per pound as made of lithographed paper, plus 15 percent as lithographed envelopes, not tissue paper at 4 cents per pound and 20 percent, plus 15 percent for lithography.

New cases before the Customs officials for decision include duplicating paper from Canada, entered as printing paper, believed to be dutiable as writing paper; bottle cap paperboard from Canada, entered as plain pulpboard, believed to be dutiable as vat-lined board; kraft from Canada, slightly mutilated by small holes at considerable distances apart, claimed to be duty free as pulp, believed by Customs officials to be usable as paper and therefore dutiable.

Two shipments of paper to Mobile, considered by Customs officials to be in excess of the legal limit for thickness of duty-free standard newsprint paper have been held by the United States Customs Court to be dutiable. The Court decided that the excess thickness was not due, as claimed, to absorption of moisture. Two cases at San Francisco in which asphalt duplex paper had been claimed to be dutiable as sheathing paper at 10 percent, but classified by Customs officials as wrapping paper at higher rates of duty, have been abandoned by the importer.

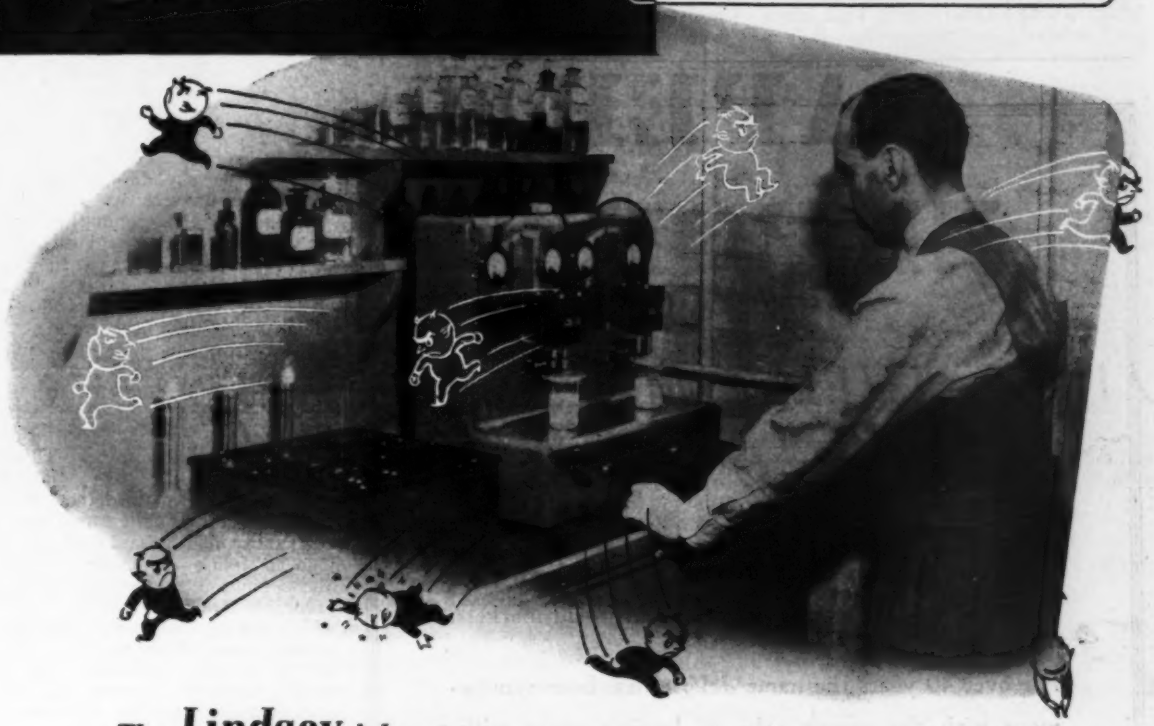


Foremen Hear Story Of Industrial Safety

MENASHA, Wis. — More than fifty foremen and supervisors attended the Twin City Safety Council meeting at Germania hall Wednesday evening, February 19, with F. G. Grabeau, Wisconsin representative of the Mine Safety Appliance Company, as the principal speaker. He discussed and exhibited new safety equipment and showed a movie on the history and development of artificial respirators. The movie showed that there are respirators available to industry for every conceivable type of hazards.

Better Material... Better Wire Cloth... Better Paper!

One Better Thing Leads to Another



The Lindsay laboratory
makes every endeavor to keep impurities out of your Fourdrinier wires

● Whether it is to test phosphor bronze or brass, as with the spectrophotometer or electrolytic analyzer above, or some other metal or material, rigid laboratory control is always at work behind the scenes to guard the quality of your wire cloth. Research and experimentation are high on the Lindsay list of "musts". We eagerly investigate every opportunity of broadening those facilities. New approaches emerge, new methods and processes, now and again a new device or machine created by our staff in line with product improvement. Every year must see better wire cloth produced—*and better paper.*

THE LINDSAY WIRE WEAVING COMPANY

14001-14299 ASPINWALL AVENUE
CLEVELAND 10, OHIO

Lindsay **WIRES**
FOR PAPER MILLS

Paper Club Promises Outstanding Dinner

NEW YORK—The sixth annual banquet of The Paper Club of New York will be held on Wednesday evening, April 2, in the grand ballroom of the Waldorf-Astoria and will be followed by supper dancing. This April, marking the 45th anniversary of the founding of The Paper Association of New York City, it has been decided that the Paper Club will pay homage to the Association and the banquet will honor that group of New York City merchants, whose adherence to high ethics and solidarity of purpose has been a shining example of good business practice for close to half a century.

The banquet committee, Charles J. Slicklen, chairman; Arthur W. Pohlman, Harry E. Gould, Willard G. Leathers, Frederic W. Mosher, E. F. (Bud) Miles, Philip L. Hovey, Stanley O. Styles and Alfred S. Walden, promises an evening as pleasant or more so than the outstanding party a year ago.

Reservations can now be made and tables will be alloted, (ten to a table) on a basis of "first come—first served." Guests should be affiliated with the paper industry and, says the committee, they and their wives are more than welcome.

PAPER EXPORT

IS A FULL TIME JOB!*

AND OUR ORGANIZATION IS GEARED TO DO THE JOB

For over 40 years the name *deVries* has been associated with paper among buyers in all world markets.

For over 40 years the name *deVries* has been synonymous with the export sales of leading paper mills.

E. de Vries Company

PAPER EXPORTERS ALL OVER THE WORLD

EDVECO 220 EAST 42nd STREET NEW YORK 17, N. Y. EDVECO

Cable address "Cellulose" New York

*Trade Mark
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Wisconsin Valley to Seek Lower Freight

STEVENS POINT, Wis. — A group of 55 representatives of business and industry voted Thursday evening, February 20, at Hotel Whiting to organize a Wisconsin Valley Industrial Council whose primary purpose it will be to obtain freight rate reductions on specific commodities in which the valley is most interested.

The meeting was arranged by the Stevens Point Chamber of Commerce. The Chamber was delegated to send notices and a review of the meeting to the various cities in the valley and to ask each to name two representatives to the council. They include the paper mill cities — all of which had representatives at the February 20 meeting —of Stevens Point, Wisconsin Rapids, Port Edwards and Wausau.

It will be the duty of the council to outline its strategy and plans in working for the elimination of what was described as a "traffic barrier."

The principal speaker at the meeting was H. R. Briggs, Madison, Wis., head of the Agency of Economic Research. He declared that freight rates offer a complex problem, with artificial barriers existing because of territorial boundaries, and suggested that efforts be concentrated on getting rate adjustments on specific commodities rather than on an effort to change the present boundaries.

Mr. Briggs explained that there are two bases for freight rates, class and commodity, and he said that class rates tend to follow commodity rates. He also emphasized the importance of favorable freight rates to industries which are contemplating relocation in smaller cities. Rates in what is known as the Chicago territory, which includes southern, eastern and northeastern Wisconsin, are discriminatory to the Wisconsin River Valley area, he said.

It was asserted by one of the representatives at the meeting that paper mills in the Wisconsin River Valley have a less favorable rate than those in the Fox River Valley.

Wisconsin Rapids Plans New Source of Power

WISCONSIN RAPIDS, Wis.—The city of Wisconsin Rapids, which now buys its electrical energy from the Consolidated Water Power Company, is considering construction of a municipal plant. An advance of $31,600 has been made by the Federal government to finance the preparation of drawings and specifications, and the city water works and lighting commission has been authorized to ask the state public service commission for permission to study the practicability of the project. It is estimated that the cost would be $857,600.

HAVE YOU TRIED AN ORR-CHEM?

THE DIFFERENCE IS ALMOST UNBELIEVABLE...

Discount the contrast between these two worn felt samples 50% because of the detail lost in printing, and the difference in them is still almost unbelievable.

Remember that these two felts *were identical,* ran on the same machine, one right after the other, under identical operating conditions and for exactly the same length of time.

How much longer the ORR-CHEM could have stayed on is hard to say. But this we can say—every extra hour, day or week of service would have saved the mill money. Already more than 100 mills have used this new chemically-treated felt and most of them have ordered, re-ordered and re-ordered again—have standardized on ORR-CHEM felts.

Accurate facts and figures are being compiled on performance by the mills—much of it already available to other mills. These reports cover the experiences of many mills with ORR-CHEMs—touch not only on wearing characteristics but explode all doubts about putting them on and starting up, about drainage, shrinkage, stretch, frequency of wash-ups, etc.

THE ORR FELT & BLANKET CO.
PIQUA, OHIO

ORR-CHEM

CHEMICALLY-TREATED FELT

DROP US A LINE . . . . YOU MIGHT EVEN INCLUDE A TRIAL ORR-CHEM ORDER . . . . WHY NOT?

Wallpaper Men Hear Of Plastic-Coat Paper

BOSTON, Mass. — Dr. Howard T. Hovde, executive director of the National Wall Paper Wholesalers' Association, who was the chief speaker at a dinner meeting of the New England Regional group at the Parker House, February 20, discussed a new plastic-impregnated wallpaper from which all marks can be easily removed.

The new plastic - impregnated wallpaper, he said, can be found soon in all colors and in 90 patterns. It's so strong you can paint the crown moulding atop your dining room and have no fears about the paper being spotted. If you let a few drops fall from your sash tool, just take a turpentine rag and wipe it off. The paper? Just as good as new, Dr. Hovde said.

The new plastic - impregnated wallpaper is so strong it will be used in trains, hospitals and on boats. It's put on with a special cement paste, prepared by the makers. It will cost $3 a roll but will last 100 times longer than ordinary paper.

Dr. Hovde reported general progress for the wallpaper industry to the New England group. He said wallpaper will be a little short in 1947 but will be more plentiful in 1948.

One of the latest innovations in the wallpaper industry is the improved oil-cloth wallpaper. This type paper has been restyled with all kinds of patterns and colors.

Since the end of the war women, he said, have shown a tendency to go in for two-tone wallpapering. Many living rooms, he said, are now being smartly redecorated with a flower design on one wall and a plain paper design on the opposite wall.

The industry's report of progress in mother's war on little junior and his pencil drawings is about all the household can hope for during the year. The wallpaper men haven't yet discovered a new method that will make it easy for amateurs to hang it properly. But that's something for the future, the industry says.

Dr. Hovde, a former faculty member of the Wharton School of Finance, has served as president of the America Marketing Association and as advisory board member of the Institute of Public Relations. He recently returned from work in Europe with the office of the foreign liquidation commissioner in Paris.

Moose, Pechin, Bauer Organize Drexel Paper

PHILADELPHIA — Morrison Moose, Charles E. Pechin and M. A. Bauer, until recently with the Wilcox-Walter-Furlong Paper Company, have organized the Drexel Paper Company, Inc., with offices and warehouse at 600 South Delaware Avenue.

Mr. Moose, president of the newly formed company, has been in the paper business approximately nineteen years, starting with the Albemarle Paper Manufacturing Company, Richmond, Va., in 1928. Six years later he was appointed district manager of the Philadelphia territory. During the war years of '42 to '44 Mr. Moose was transferred to Roanoke Roads Division, North Carolina as manager of pulp wood operations, at which time he earned the distinction of securing the services of the first group of Italian and German prisoners of war for cutting wood pulp in that area, and, through this additional production of pulp wood, the new operations under his direction put into effect the Mill's production on a hundred percent basis. In 1944 he joined Wilcox-Walter-Furlong Paper Company as sales manager of the coarse paper department.

Charles E. Pechin, vice president, served as Eastern sales representative of the Robert Johnson Chocolate Company and also the International Plastic Company of Morristown, N. J., later entering the employ of Wilcox-Walter-Furlong Paper Company.

M. A. Bauer, secretary, entered the sales department of Dill & Collins division of Mead Corporation remaining there until 1945 when he joined the Wilcox - Walter - Furlong Paper Company.

Name your Machine and Jordan Chest Requirements
EAGLE-A PAPERS
Warren Machine and Jordan Chest Pumps in operation at Riverside and Linden Divisions of American Writing Paper Corporation, Holyoke, Mass., manufacturers of famous Eagle-A Nationally Advertised Papers.

Warren Meets Every One!

SMOOTH FLOW: Unlike a plunger pump, the Warren Centrifugal gives smooth flow without pulsation.

REGULATION: Easily throttled, and unlike a plunger pump, the discharge valve may be closed without building up excessive pressure on pump and discharge line.

COMPACTNESS: Takes up less floor space and very much less head room than a plunger pump of equal capacity.

CLEAN STOCK: There are no pockets, as in a plunger pump, to hold stock from previous furnish.

ACCESSIBILITY: Diagonally split case makes it unnecessary to remove discharge piping. Rotating member easily lifted out.

MAINTENANCE: Low maintenance charges as compared with a plunger pump. Renewable liners prevent wear on suction heads. No large plunger stuffing boxes to be packed or to create friction on plungers. No plungers to be turned or replaced.

INITIAL COST: Lower than a plunger pump of much less capacity.

QUIET OPERATION: No gears making a continuous noise and creating vibration.

APPLICATION: Warren not only has the pump for this most vital service but the experience and ability to engineer its proper application.

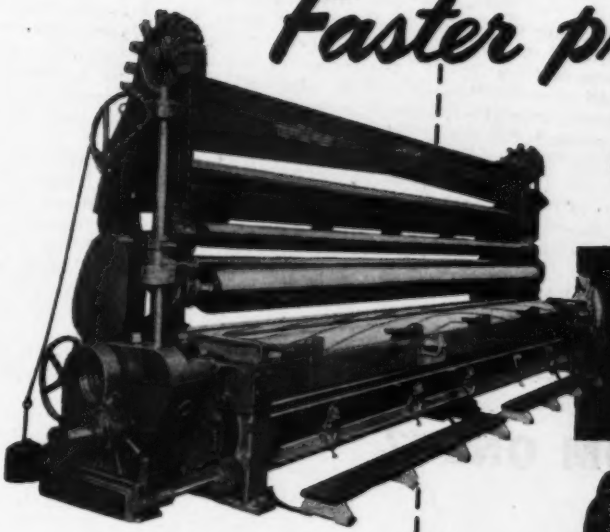
Why not try a performance tested

Warren

MACHINE CHEST PUMP PP-51

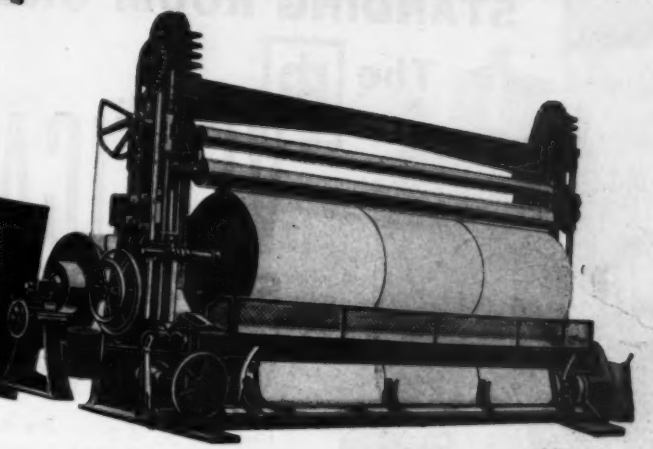
Warren Steam Pump Company, Inc., Warren, Massachusetts

Faster production of Better Rolls



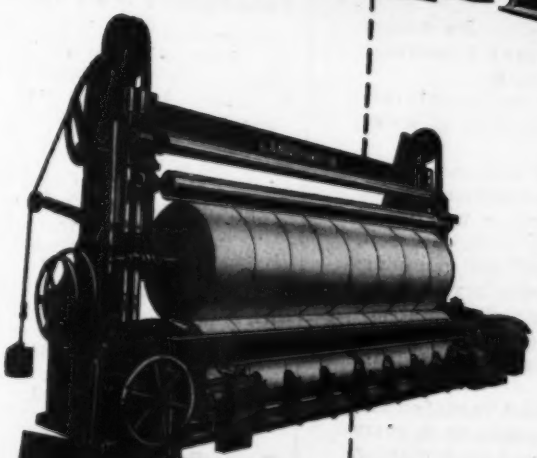
CAMACHINE 20

For newsprint, book and kraft. Web widths 180" to 310". Speeds up to 3000 fpm.



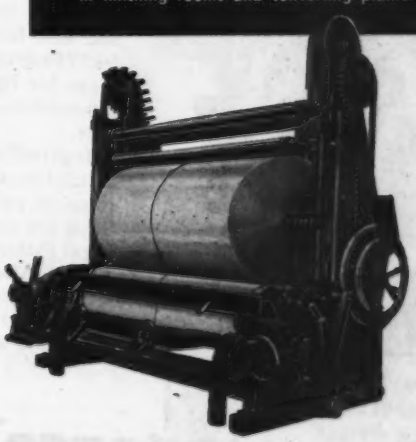
CAMACHINE 19

For newsprint, book and kraft. Web widths 118" to 192". Speeds up to 2800 fpm.



CAMACHINE 14

For paper and paperboard. Web widths 53" to 90". Speeds up to 1400 fpm on paper, 800 fpm on board. Also widely used as rewinder in finishing rooms and converting plants.



CAMACHINE 18

For paper and paperboard. Web widths 73" to 162" on paper, 73" to 142" on board. Speeds up to 2000 fpm on paper, 1200 fpm on board.

WRITE FOR LITERATURE

CAMERON MACHINE COMPANY . 61 POPLAR STREET BROOKLYN 2, N. Y

CIO Paperworkers Set National Program

CLEVELAND — Unanimous support of 250 delegates to the Policy Convention of the United Paperworkers of America - CIO was given to the policy of requesting substantial wage increases, health and welfare insurance, six paid holidays and further improvements in union agreements.

The delegates, representing 147 local union affiliates, supported a resolution calling for a concerted campaign to organize the paper industry of the U. S. and Canada. Each local was called upon to act as an organizing committee and each member to act as an organizer.

Without a dissenting vote, the delegates agreed to bar from positions as officers or representatives of UPA-CIO or its subdivisions all those who oppose the democratic form of government. The resolution stated:

"We pledge our allegiance to the government of the United States of America and the principles upon which it is based as stated in the Constitution and the Declaration of Independence.

"We condemn Communists, Nazis, Fascists and all other political parties, groups and philosophies that advocate the destruction of our democratic form of government and the establishment of dictatorship.

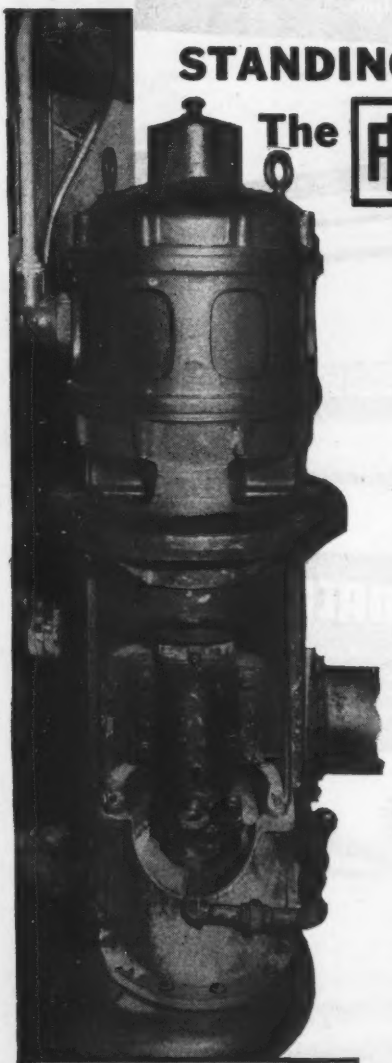
"Only those who subscribe to the democratic form of government as stated in the U. S. Constitution shall be eligible for positions as officers, representatives, or agents of the United Paperworkers of America or its subdivisions."

In other actions, the convention defended the Wagner Act, urged the passage of a 65-cent minimum wage law and pledged to fight against repressive anti-labor legislation. The delegates also pledged UPA to "fight for full enjoyment of all rights by all Americans regardless of race, color, creed or national origin."

Allan S. Haywood, UPA chairman and National CIO vice-president, presided at the sessions.

The convention banquet was addressed by David J. McDonald, secretary-treasurer of the United Steelworkers, and Charles Lanning, secretary-treasurer of the United Rubber Workers. On behalf of UPA-CIO, Director Frank Grasso and Secretary-Treasurer Harry Sayre presented Mr. Haywood with a scroll.

Kermit Eby, National CIO Director of Education and Research, spoke to the delegates on the Nathan Report. Other addresses were delivered by Frank Fernback of the Committee for a Labor Education Extension Service, Rev. Francis B. Sayre and Father Richard Deeters.



STANDING ROOM ONLY?

The I-R VERTICAL STOCK PUMP

is built to solve your space problems

In addition, it often fits suction conditions that are not favorable for horizontal pumps.

For pit work, the motor is carried safely above the high-water level.

Like the I-R horizontal stock pump, it is recommended for high consistency or unscreened stock, such as in bull-screen, blow-pit, or diffusor pumping, and also for broke-beater transfer. These units also offer advantages for lighter jobs where the refinements provided are desirable.

Ingersoll-Rand manufactures a full line of pumps to fit every phase of pulp and paper making. Send for catalog 7022, "Centrifugal Pumps for Pulp and Paper Mills." Also call an I-R engineer —there's one near you—who will gladly discuss your pumping problems with you.

AIR TOOLS
COMPRESSORS
ROCK DRILLS
TURBO BLOWERS
CONDENSERS
CENTRIFUGAL PUMPS
OIL & GAS ENGINES

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

10-942

Michigan Superintendents Will View Heller & Merz Movie

KALAMAZOO, Mich.—The next meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association will be held Thursday evening, March 20, 1947, at the Park American Hotel. Dinner will be served at 6:30 p.m. Heller & Merz of the Calco Chemical Division of the American Cyanamid Company are presenting a colored movie, "The Portrait of an Industry." The movie will last about thirty minutes.

Following the movie will be a question and answer session. Four well-known superintendents from the Kalamazoo Valley will preside so any general questions referring to paper or board should be answered.

Paper Products Plans Improvements in Plant

SWARTHMORE, Pa. — Paper Products Manufacturing Co. is planning an extensive improvement program to cover paper machines, converting department and power plant. John W. MacAllister, plant manager, will be in direct charge of this program and production operations.

New officers of the company are: G. F. Jess, vice-president, and C. A. Ernst, Jr., treasurer. W. S. Sprague, president and manager for many years, remains as president.

Two ways to—

REDUCE COSTS

in papermaking

...you can partly offset the shortage and rising cost of fiber and cut operating costs also by using...

DICALITE Paper Aids

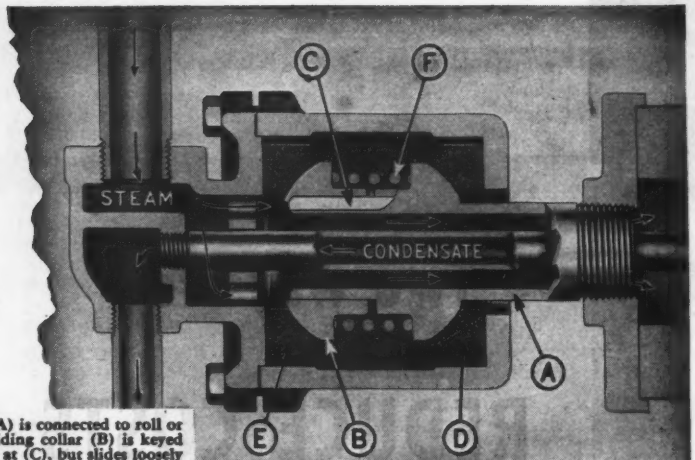
1. It has been conclusively shown in production test runs as well as in long periods of regular use, that Dicalite saves fiber. This is done in two ways: (a) by increasing retention of fine fibers; (b) by bulking properties of Dicalite which "extends" the fiber. In addition, retention of pigment and fillers is increased for further economy.

2. The use of Dicalite also gives purely operational advantages that help to reduce costs. Water drainage from the sheet on the wire is faster. Further, Dicalite facilitates release of moisture vapor from the sheet on the dryers. These two benefits, coupled with less time lost by breaks, cleanups, etc., permit increased machine speed, higher output and lower unit costs.

THE DICALITE COMPANY

CHICAGO 11 NEW YORK 17 LOS ANGELES 14

DICALITE PAPER-AID FOR BETTER PAPER PRODUCTS



Nipple (A) is connected to roll or drum. Sliding collar (B) is keyed to nipple at (C), but slides loosely over it so pressure can fill entire housing. This pressure becomes the sealing force, by pressing seal ring (D) tightly against nipple. Both seal ring and bearing ring (E) are of special carbon-graphite, which eliminates oiling and packing. Spring (F) is for initial seating only. Type B Joint illustrated; other types, sizes for all needs.

...it's the biggest little trouble-saver in the mill...

In terms of physical size alone, the Johnson Joint could hardly be called big machinery. But in its ability to save time and trouble, and promote plant efficiency, its stature approaches anything the industry has ever seen.

The Johnson Joint was designed to go after the old stuffing box and steam fit troubles in a businesslike way, and it literally knocks the stuffing out of them. There's no packing of any kind. There's no oiling required, ever. There's no adjusting — the higher the pressure, the tighter the seal. There's little to fear from misalignment—with provision for both lateral and angular movement built right in. Note besides how neatly it provides for more efficient syphon drainage, through the same head that admits the steam.

In dollars and cents, what does all this add up to? Well . . . enough at least to pay the cost of switching over to Johnson Joints in just a short while. Enough certainly to make the Johnson Joint too big to overlook.

Write for literature and the name of your nearby Johnson representative.

JOHNSON
Rotary Pressure
JOINTS

THE JOHNSON CORPORATION
828 WOOD STREET
THREE RIVERS, MICHIGAN

OBITUARY

Clarence A. Clough

ENGLEWOOD, N. J.—Clarence A. Clough, former Mayor of Englewood and Closter, N. J., who was president of the Book Paper Association for many years, died here at his home this afternoon. His age was 64.

Born in Lockhaven, Pa., son of Dana B. and Lucinda Eilert Clough, Mr. Clough was a descendant of Sir Arthur Hugh Clough, British poet. Until shortly before his death he was secretary and general manager of the New York and Pennsylvania Company, with which he had been associated since 1900. He was also secretary and manager of the Castanea Paper Company.

Mr. Clough leaves a widow, the former Ethel Kipp; two daughters, Mrs. Phillip Banker and Miss Constance Clough; a son, Peter K. Clough; a sister, Mrs. A. W. Weeks, and a grandson, Jay Clough.

Robert W. Gallagher

BUFFALO, N. Y. — Robert W. Gallagher, former vice-president of Hubbs & Howe, wholesale paper firm, died February 19 after an illness of several years. He was 73 years old.

Mr. Gallagher joined Hubbs & Howe early in his career and rose to the vice-presidency. He also was a director of the Anglo-American Paper Company, which manufactured much of the paper handled by Hubbs & Howe. His association with Hubbs & Howe was discontinued four years ago because of ill health but he retained his interest in the Toronto company.

Mr. Gallagher served as postmaster of Buffalo under Presidents Harding, Coolidge and Hoover. He was a former president of the Greater Buffalo Advertising Club, secretary of the Buffalo Club, director of the Buffalo Canoe Club and the Buffalo Chamber of Commerce.

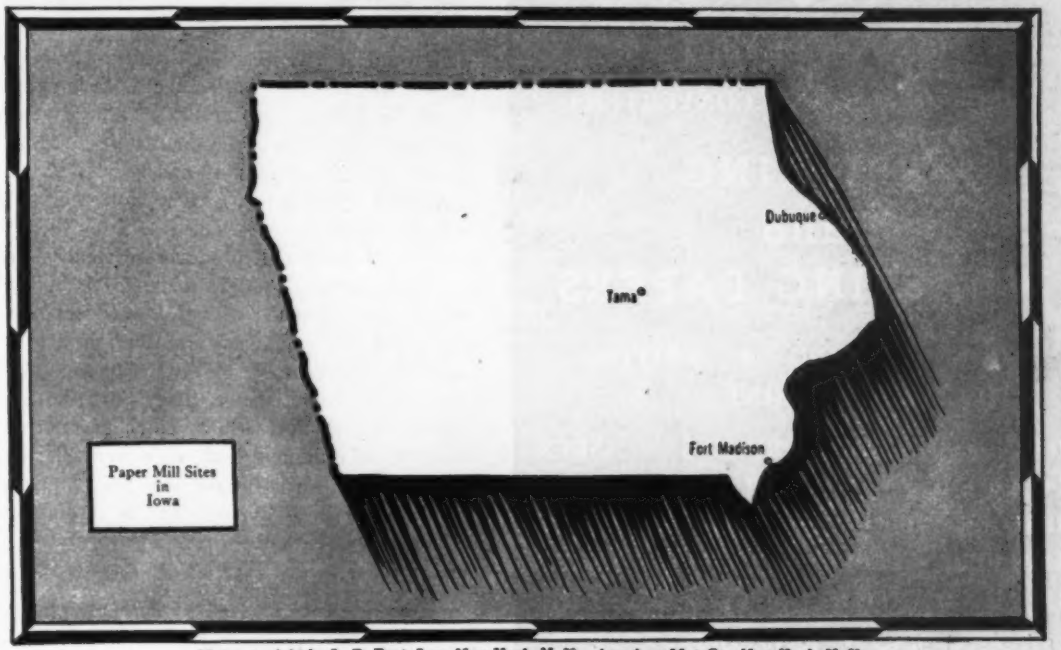
Willard Barnhart II

GRAND RAPIDS, Mich. — Williard Barnhart, II, 52, widely known in the paper mill industry as Bill Barnhart, died February 6th, at his home in Grand Rapids, Michigan. In January, 1933, he jcined the American Box Board Company as production consultant. In 1937 he became assistant superintendent of mills, and in 1939 was appointed superintendent of mills. Advancement was again in order and in 1944 he became assistant to production manager, and in January, 1946, was promoted to the position of director of purchases.

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 27 PUBLISHED BY DRAPER BROTHERS COMPANY · CANTON, MASSACHUSETTS



Map copyright by L. D. Post, Inc., New York, N. Y. American Map Co., New York, N. Y.

HIGH LIGHTS: Iowa is dependent upon its native straw for pulp. It makes no great claims as a papermaking state, but as pulpwood grows scarcer, the day may well come when cellulose from the annual crop products of Iowa may play an increasingly important part in the economy of the paper industry.

Its first mill is believed to have been established at Coralville in 1866. A sample sheet, said to have been made there is in the possession of the State Historical Society at Iowa City, but the mill has disappeared.

Of the three plants listed in the directories for the State of Iowa, one converts cornstalks on a specially designed machine into structural insulation. A second manufactures straw-, chip- and other board; the third makes straw paper for corrugating. The capacity of these three plants per day is rated at 495,000 pounds.

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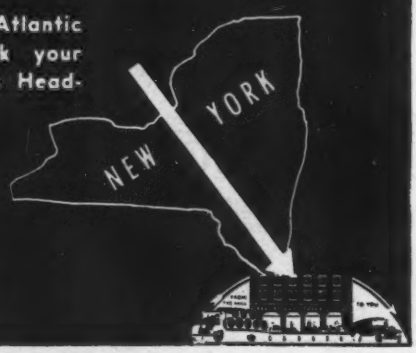

IN PART

If the United States does experience a general business recession, the growing resistance against high prices generally might affect the pulp market. However, it looks to me as though the physical inability of the world's pulp mills to satisfy world market demand for pulp would tend to offset a pronounced weakness in pulp prices which would normally be experienced under conditions of a general business recession.

In fact, it wouldn't surprise me much to see some further advances in world market prices for pulp for the second quarter of 1947, when new supply will be at its low for the year. I think that both buyers and sellers would be well-advised to study carefully the statistical position of the industry before making firm commitments for the last six months of this year, although I do not look for a real "buyers' market" for some time to come.

Despite this favorable outlook (from the sellers' point of view) I think that producers of market pulp should consider carefully the advantages of long-range market stability as contrasted with those of temporary speculative opportunists. Excessively high pulp prices, while undoubtedly obtainable today, invite speculative expansion and buyer resistance. They pave the way for unhealthy market fluctuations which are not in the best interests, over the long pull, of either seller or buyer of wood pulp. It seems to me that the emphasis in 1947 should be in *production* rather than on getting what the market will stand.—*From the report of Oliver M. Porter to the United States Pulp Producers Association.*

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
January 11	102.6	January 12	95.3
January 18	103.8	January 19	94.4
January 25	103.7	January 26	94.5
February 1	104.0	February 2	101.5
February 8	106.2	February 9	99.7
February 15	*106.3*	February 16	95.0

COMPARATIVE MONTHLY SUMMARIES

1946		April	102.7	Aug.	104.7	Dec.	97.0
Jan.	94.7	May	100.7	Sept.	101.3	Year Avg.	101.1
Feb.	98.4	June	104.6	Oct.	106.4	1947	
Mar.	104.4	July	94.0	Nov.	105.5	Jan.	*102.1*

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	88.7	86.5	104.1	87.4	88.7	86.4	95.4	*104.2*
Year Average	85.6	97.4	90.4	87.8	88.1	89.7	101.1	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
January 11	102	January 12	94
January 18	103	January 19	93
January 25	101	January 26	94
February 1	102	February 2	95
February 8	104	February 9	97
February 15	*102*	February 16	94

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	97	100	99	94	97	89	99	96	100	99	92	96
1947	99												

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

EDITORIAL

Tomorrow's Pulp

The distributing and converting, as well as the manufacturing segments of the vast pulp and paper industry will find a calm objectivity in the report that E. W. Tinker, its secretary, made this week to the American Paper and Pulp Association that is reassuring over the long range ahead. His whole talk, crisply summarizing details that otherwise would require pages of elaboration, was devoted to an examination of the future market for pulpwood products, which he found as steadily progressing in its promise as the nation's standards of literacy and hygiene.

Even more heartening however, was his summary of the prospects for future materials to meet this demand. He finds that private enterprise, as represented by the pulp and paper interests themselves, are assuming their responsibility for this portion of their future. Taking woodlands under their own care they are adopting policies which will encourage Nature to provide, on conveniently accessible lands, the pulpwood that will be needed in the years ahead.

Two great untouched stands of timber now exist, with the possibility always present that some day it will be profitable to rely on them for current needs. Both of these, one in the Continental Divide from Idaho to New Mexico, and the other in Alaska, are under Government Forest Service control, and in the case of both obstacles exist to their reasonably low cost operation. In the case of the nearer source, the outstanding difficulty would appear to be the shortage of adequate water supplies for paper production. In the case of the more remote source high costs of plant and labor, along with forbidding contract terms have operated, so far, to retard development.

But a solution is closer at hand than either, Mr. Tinker finds. That solution lies in the forests that have served mills now existing, once their productivity has been established on a basis that compensates for the annual toll of timber withdrawn from them. On the basis of present drain on the pulpwood store in the forests some forty million more acres must be made productive to restore a balance between annual growth and annual cutting.

Against this, it is estimated that nearly fifteen million acres are under ownership of pulp and paper companies, and that of these properties more than twelve million are now under a type of forest management that is calculated to replace the wood that is cut. And the great acreages that are being acquired by companies within the industry indicate that appreciation of the importance of this replacement problem is found profitable. It is cheaper, some find, to grow trees than it is to move mills and populations. And, in the long run, it is regarded as sounder economics.

Competition at the Source

While the pulp and paper mills are pondering their own present and probable future requirements for pulpwood, and are giving a good deal of thought to conservation measures in the interest of future supply, other trades are insistent that too much encouragement already has been given to the industry. These would have the allocation of wood rigidly restricted to the end that less should go into paper and more elsewhere.

Wholesale lumber dealers of Ontario do some plain speaking concerning the pulp and paper interests in their brief presented to the Ontario Royal Commission investigating the timber industry. The Wholesale Lumber Dealers' Association, Inc., is made up of the majority of wholesale lumber dealers in Ontario.

A summary of the brief placed before the Royal Commission indicates that the wholesale lumber dealers agree with the Provincial Government that the forest wealth of the Province should be perpetuated by a policy of regarding trees as a crop and that the Government should prevent the exploitation of the Province's timber resources. They claim the present trend in handling the problem indicates all too clearly that the lumber industry in this Province is to rapidly dropping out of the picture. They say: "If these tendencies are not halted, in 20 or 25 years, the volume of sawn lumber produced in Ontario will only approximate 10 to 15 per cent of the province's normal requirements." Ontario saw mills presently provide, perhaps, 50 per cent of the province's requirements.

Educational

Too many mills are too far away from population centers to expect that the example can be generally followed. But is may be expected that for itself, and to some extent for the industry at large, the Union Bag and Paper Company will derive a definite measure of benefit in the understanding of its operations that it will make possible for citizens of Georgia in its proposal to conduct sightseeing trips through its plant at Savannah, where a series of educational tours is now being arranged for the late summer and early fall for the purpose of acquainting business and civic leaders with the installations now under construction.

In announcing the proposed tours, Manager T. T. Dunn said: "We are rather proud of the fact that we are continuing to grow and we believe that Savannahians, many of whom have already gone through the plant, will be interested in viewing the greatly enlarged facilities."

W. L. Cook EDITOR

Pulp Imports Sagged Canada Shipments Up

WASHINGTON — Imports of wood pulp into the United States from all sources totaled 167,952 short tons in January 1947 as compared with 232,992 tons in January 1946, the Department of Commerce reported today. In January this year Canada ranked as the principal supplier whereas in January 1946 Sweden was in first place. A year ago Sweden was shipping pulp which had been accumulated in stocks from production during the war years.

Data on imports, prepared by the Pulp and Paper Service, Office of International Trade, follow:

Imports from Canada in January this year were about 9,000 tons larger than in January 1946. Imports from Sweden, on the other hand, were about 67,000 tons less than in January 1946.

Of total January 1947 imports, 19,043 tons were of rayon or special chemical grades of bleached sulphite pulp, an increase of about 4,500 tons over January 1946. Imports of all other grades of pulp as used in the manufacture of paper in January 1947 totaled approximately 150,000 tons.

United States consumption by paper mills of imported pulp averages around 125,000 tons a month, indicating a slight surplus for inventories. However, imports from overseas sources in February, March and April, when Northern European ocean shipping lanes are usually frozen, are expected to be relatively small and will probably not be sufficient for current consumption.

Hollingsworth & Whitney Appoints Case and Davis

BOSTON — Ralph B. Case becomes New York sales manager and T. K. Davis Boston sales manager for the Hollingsworth & Whitney Company, effective March 1.

Mr. Case started work with H. & W. in the Boston office in 1909. He enjoyed a well-rounded experience in various phases of the company's business and was appointed assistant sales manager in 1936. In taking over his new duties in the company's largest sales division, Mr. Case brings with him a sound industry background.

T. K. Davis, who becomes Boston sales manager, has been in paper sales work for more than 30 years. During that period, his experience included the distribution of bleached and unbleached kraft, sulphite and groundwood papers. Before joining the Hollingsworth & Whitney New York office March 1, 1944, he had been sales manager of a well-known New England paper mill for 13 years. T. K., as he is commonly referred to in the trade, has concentrated his activities in the Atlantic seaboard states during recent years.

Textile Chemicals Up-to-Date

The fourth edition of the buyers' guide to textile chemical products, which contains considerable data of value to the paper and pulp industry, is now available to old and new subscribers. It contains the offerings of 193 American manufacturers and lists them first by company so that a firm's entire range of output in the field can be seen at a glance.

The products are then classified according to their use. Here the reader will find acids, detergents, boil-off assistant, and the like listed under their headings together with the company that makes them, and in most cases, their chemical composition. Finally, there is an alphabetical list of the products—two thousand of them —by name with their sources.

The value of this guide lies in its convenient arrangement, which enables a buyer or user to find the products he wants or needs, and its manufacturer. It is particularly valuable at this time because of the many changes which have occurred in the chemical supply field. The editor is H. R. Mauersberger, technical editor of Rayon Textile Monthly.

TEXTILE CHEMICAL SPECIALTY GUIDE, 1946-47 edition, 408 pages including indexes. Format 9x6 inches. $5.00 in U.S.A. and Canada; $6.00 foreign countries. Textile Book Publishers, Inc., New York 16, N. Y.

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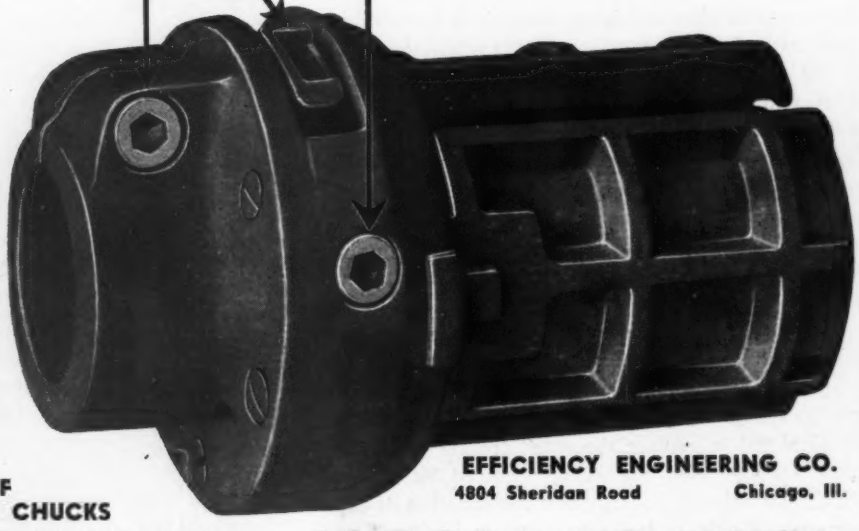

INSTRUCTIONS

A—TO LOCK CHUCK at proper position on shaft insert hex wrench and tighten down socket bolt A firmly.

B—TO LOCK ROLL TO SHAFT insert flat bar tool at B and pull upward firmly.

C—TO LOCK EXPANSION —insert hex wrench and tighten socket bolt C.

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6—No lefts or rights—Each chuck of a pair is the same.
7—Withstands unlimited tension.

New Welded Hydrapulper Has Many Economical Features

Many unique features are combined in the new all-welded steel Dilts hydrapulper which has just been installed in the new addition to the plant of the National Paper Corporation at Ransom, Pennsylvania.

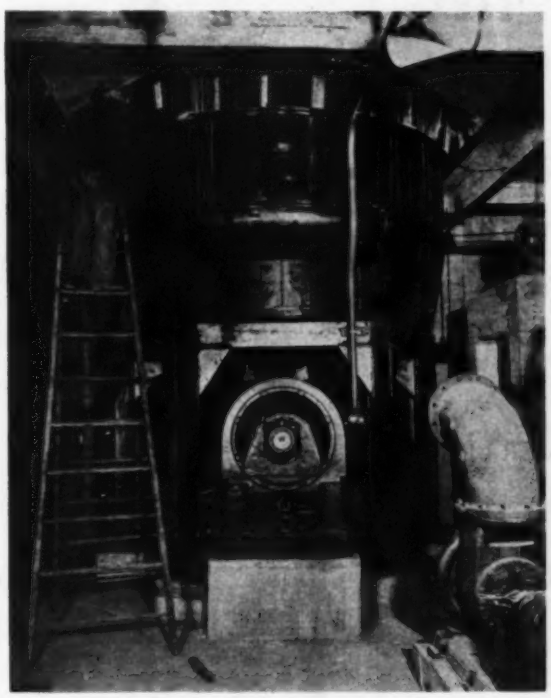
Installed primarily for the processing of facial and toilet tissues, this hydrapulper, 12 feet in diameter, is constructed almost entirely of Lukens Nickel-Clad Steel, a feature which, by virtue of its corrosion resistant qualities, protects the paper stock from rust stains and other damages. This material is also highly resistant to wear and abrasion.

The complete welded unit was constructed and shipped in four sections. These consisted of two semi-circular side sections, a bottom section, rolled and dished by the Lukens Steel Company, and the rotor, which was cast of three percent nickel alloy cast iron at the Black-Clawson Foundry, Hamilton, Ohio, to provide resistance to the highly abrasive action involved.

This simplicity of design offers several advantages. In the first place, it saves shipping time, space and weight. There are fewer pieces to fasten down or to shake loose and thus become subject to damage in shipment.

Also, less time is required to level up, set the additional pieces in place and weld a few seams. This obviously shortens the completion of all assembly operations. The welded seams prevent leaks at the joints and eliminate the need for calking.

Welded construction minimizes the number of bolts and screws needed, assists in the elimination of vibration, and generally provides rigid construction throughout.



Exterior view of Hydrapulper base

Internal View of the Welded Hydrapulper from above

The function of the hydrapulper is to replace the older and less efficient pulpers and breaker beaters. It quickly reduces almost any fibrous material to slush form at various consistencies up to 6 percent, and often higher. The hydrapulper is built for either batch or continuous operation with a size range from 3 feet in diameter for laboratory or pilot plant use up to units 20 feet in diameter which can produce up to 200 tons of defibered or slush stock daily.

A ruggedly constructed spiral bevel or hypoid reduction gear, vertical output drive, is provided with each hydrapulper. This drive is used for turning the rotor and is capable of withstanding any shock load imposed.

The basic furnish or stock at National is a combination of virgin pulps and reclaimed paper which is dumped into the hydrapulper tub along with the required amount of water. The rotor, turning at 195 RPM, quickly breaks down the furnish to a flowable form and color and sizing are added according to requirements for the finished paper. Such chemical additions are often corrosive in nature and, therefore, add to the need for protecting the hydrapulper against corrosion. Each batch is thoroughly defibered and blended in a matter of seconds, and then dumped to the next stage of operations.

After leaving the hydrapulper, the stock is usually sent to stock chests where it is recirculated and then passed through Dilts Hydrafiners and Miami Jordans for further processing before going to the paper machine.

This all-welded design of hydrapulper represents the culmination of the joint cooperative efforts of the Smith & Caffrey Company, Syracuse, New York and the Dilts Machine Works, Fulton, New York, a division of the Black-Clawson Company, Inc., Hamilton, Ohio. The Lukens Nickel-Clad steel construction is finding new applications steadily as it joins the many hydrapulpers already serving the pulp and paper industry.

Bardwell Bag Corp. Opens New Plant

GRETNA, La. — Organization of the Bardwell Bag Corporation, as a manufacturer of specialty printed and unprinted paper bags and wrappers has been reported by the company president, Dewey D. Bardwell at New Orleans.

Design, sales and production executives, each with more than a decade of experience in manufacture of bags and wrappers will assure quality in Bardwell packages. Assistance in bag or wrapper design, for new products or to improve selling quality of old ones, will be available to users where desired. Operating executives of the new company are Dewey D. Bardwell, Henry D. Childers, and Richard Volksdorf.

Mr. Bardwell, a graduate of Louisiana State University where he received a B.S. in 1932 and of Columbia University where he received his M.A. degree in 1935, entered the paper industry in 1936. His activity included sales work with the Container Corporation of America, representative of the Thomas M. Royal Company in their southern territory, and with the Continental Bag and Specialty Corporation in sales work.

Henry D. Childers, vice-president in charge of operation, has devoted 23 years to paper processing. He began with the Hummel-Ross Fiber Corporation at Hopewell, Va., next he went to the Container Corporation of America as paper board manufacturer's machine operator. He left this work to join the staff of Thomas M. Royal and Company at Philadelphia, where he spent 17 years purchasing. From January 1946 to August 1946, he was general manager of the Wrapade Machine Company.

Richard Volksdorf, production manager, was born in Hamburg, Germany, whence he came to the United States in November 1927 becoming an American citizen in 1934. With the Thomas M. Royal Company he operated all classes of bag machines and aniline printing equipment. After ten years, he was promoted to foreman being later transferred to Royal's Bryn Mawr factory, where he was in charge of over 200 manufacturing employees.

Plant and offices of the Bardwell Bag Corporation are located at Perry and Madison Streets, Gretna, Louisiana—on the west bank of the Mississippi River opposite New Orleans. The location is strategic from the standpoint of skilled labor supply and transportation facilities, which serve the Bardwell territory.

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Union Bag Will Show Wet Strength Papers

NEW YORK — Wet strength paper, which absorbs moisture without breaking, will be featured by Union Bag & Paper Corporation in its exhibit at the Packaging Exposition in Exhibit Hall, Philadelphia, April 8-11.

Displayed against a nautical background will be many types of wet strength bags made by Union Bag & Paper, from the Pek bags with the cellophane window widely used for prepackaging fresh, wet produce, to the heavy-duty, six-ply multiwall bags developed during the war which can be immersed in water without harm to their contents.

Also featured will be the 10-, 15-, and 50-pound wet strength potato bags now used country-wide to prepackage potatoes at the shipping point in retail quantities. This relieves the store owner from the task of sorting, weighing and sacking the vegetables, and saves time for the shopper who can pick them directly from the counter without waiting.

Union Bag will occupy Booth 411. Company representatives present will include: Sales Promotion Department, Karl Smith, H. P. Lankenau, G. W. Donaldson; Specialty Sales, J. P. Duffy, E. M. Rickel, F. H. Meendsen, I. L. Hendricksen, R. Bennett, R. Shannon, L. Massey, L. Hiscox, L. H. Flacksenhaar; Multiwall Bag Sales, G. P. Haberstein, C. L. Woolsey, H. Recher; Packaging Machinery Department, R. E. Read, W. H. Mellick, R. A. Mahaffy, W. O. Oschman, J. A. Pratt.

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FINANCE

Puget Sound Income Up Sharply in 1946

BELLINGHAM, Wash. — Preliminary figures, subject to audit, indicate that Puget Sound Pulp & Timber Co. realized a net income of $1,320,507 from operations in 1946, in comparison with an operating profit of $409,530 in 1945, or with $602,624 net income for that year including $193,094 net capital gain from sale of Canadian timber properties.

Operating net after preferred dividends equaled $3.83 a share on the common stock, against $1.05 a share from operations in 1945, or $1.64 including net capital gain of 59 cents.

Net profit from operations in the fourth quarter of 1946 amounted to $535,885, or $1.58 per common share, in comparison with $436,785, or $1.29 a share in the third quarter of 1946, and with $82,944, or 20 cents a share in the fourth quarter of 1945.

Pulp production totaled 84,257 tons in 1946, against 87,641 tons in 1945. Net sales and other income amounted to $7,333,777 in 1946, compared with $6,327,831 in 1945. After non-recurring write-offs of $66,519, mainly representing abandonment of the old saw mill which was replaced by the hydraulic barker and whole log chipper, profit before provision for Federal income taxes amounted to $2,129,850 in 1946, in comparison with $842,341 in 1945. Provision for Federal income taxes amounted to $809,343 for 1946, up from $432,811 the year before.

Marathon Sales Rise 2 Million in First Quarter

ROTHSCHILD, Wis.—Net sales of $9,594,419 for the first quarter ended January 31, 1947, up $2,000,000 from the $7,594,264 sales reported for the same period in the preceding fiscal year. Net profits were $1,130,837, compared with $757,665 in the first quarter a year before, representing an increase of 49 percent. Profits in the latest quarter were after provisions for income and excess profits taxes totaling $795,235, compared with tax provisions of $570,980 in the same quarter of the preceding year.

The net earnings, after deduction of $62,500 for preferred dividends paid January 1, were equivalent to 82 cents a share on 1,300,000 shares of $6.25 par value common stock outstanding, compared with 53 cents a share, based on the same number of common shares, a year before. A quarterly dividend of 25 cents a share was paid on the common stock February 20.

Glatfelter Doubled Its Net In 1946 Operation

SPRING GROVE, Pa.—P. H. Glatfelter Company, manufacturers of fine grade book, bond, writing and envelope papers, reports for the year of 1946 a net income after all charges, including Federal and State taxes and contingency reserve, amounting to $365,673.76 as compared with $182,423.03 for the year 1945."

Warren Sales, Net, Reported at High

BOSTON — Stockholders of S. D. Warren Co. voted on a four-for-one split-up of the company's common stock at the annual meeting held on Feb. 24.

There were 101,387 shares of common outstanding, which would be split into 405,548 shares. These are preceded by 28,263 shares of $4.50 preferred.

For the year ended Dec. 31, 1946, the company reports record sales of $21,854,612, which compared with $15,895,832 in 1945. Net income after interest and federal taxes was $1,597,370, compared with $461,256 in 1945.

"During 1947," states President George Olmsted, Jr., in letter to stockholders, "we expect an increase in our productive capacity, the initial merchandising of several new products, and some cost reductions due to the use of more efficient equipment. While we should expect a reasonably good year for your company in 1947, nevertheless we may be plagued with shortages of some raw materials, and no one can accurately forecast the duration of the current demand for paper and paper products."

Wallpaper Directors Declare Dividend

CHICAGO—Directors of United Wallpaper, Inc., declared the regular quarterly dividend of 50 cents per share on the 40,000 shares outstanding of the four percent cumulative convertible preferred stock, payable April 15 to stock of record at the close of business April 1.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending February 22, 1947

STOCKS

	High	Low	Last
A. P. W.	6½	5⅜	6⅜
Armstrong Cork Co.	50½	48¾	50½
Armstrong Cork Co., pf.	110	108¼	108½
Celotex Corp.	32½	31⅜	32½
Celotex Corp., pf.	21¾	19½	21¾
Certain-Teed Products Corp.	20¼	19⅜	19⅜
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	26¾	25½	26½
Champion Paper & Fibre Co., pf.	109½	109½	109½
Congoleum Nairn Co.	29¾	29¼	29½
Container Corp. of America	47½	46	47½
Crown Zellerbach Co.	31	30¼	30¾
Crown Zellerbach Co., pf. 4.20	107⅞	106¾	107⅞
Crown Zellerbach Co., 4 pf. 4	119⅜	119	119⅛
Dixie Cup Co.	35¼	31¾	35¼
Dixie Cup Co. A	53½	52¾	53½
Flintkote Co.	36¾	35	35⅛
Flintkote Co., pf.	109⅞	109	109⅞
Robert Gair	7¾	7⅜	7¾
Robert Gair, pf.	20	19⅝	20
International Paper Co.	51⅛	48⅞	50⅞
International Paper Co., pf.	104⅝	103½	103½
Johns-Manville Corp.	137	129½	137
Johns-Manville Corp., pf.	123½	123	123½
Kimberly-Clark Corp.	27½	27⅛	27⅜
Kimberly-Clark Corp., pf.	114	114	114
Mac Andrews & Forbes	37½	37½	37½
Mac Andrews & Forbes, pf.	....	....	....
Marathon Corp.	27⅜	27½	27⅛
Mead Corp.	22¾	22⅛	22½
Mead Corp., pf. 4¼	104¾	104¾	104¾
Mead Corp., pf. 2	49	48½	49
National Container Corp.	40½	39	40
Paraffine Companies, Inc.	78½	78	78
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	24	23⅛	23¼
Rayonier, Inc., pf.	38⅜	37⅛	37¾
Ruberoid Co.	56	54½	55¾
Scott Paper Co.	46½	45½	46½
Scott Paper Co., pf.	99½	99	99
Sutherland Paper Co.	45⅛	43⅞	44½
Union Bag & Paper Corp.	34½	32¾	32½
United Paperboard Co.	19¼	14⅞	17¾
U. S. Gypsum Co.	106	103	103½
U. S. Gypsum Co., pf.	191	191	191
West Virginia Pulp & Paper Co.	43½	39¼	43½
West Virginia Pulp & Paper Co., pf.	112	112	112

BONDS

Abitibi Pulp & Paper Co. 5s '53	....	....	....
Celotex Corp. 3½s '60	....	....	....
Certain-Teed Products Corp. 5½s '53	....	....	....
Champion Paper & Fibre Co. 3s '65	....	....	....
Mead Corp. 3s '66	103½	103½	103½

New York Curb Exchange

High, Low and Last for Week Ending February 22, 1947

STOCKS

	High	Low	Last
Great Northern Paper Co.	42½	41⅜	42½
Hummel Ross Fibre Corp.	32¾	31½	32
St. Regis Paper Co.	10⅜	10	10⅛
Taggart Corp.	8⅞	8⅞	8⅞

BONDS

American Writing Paper Co. 6s '61	....	....	....

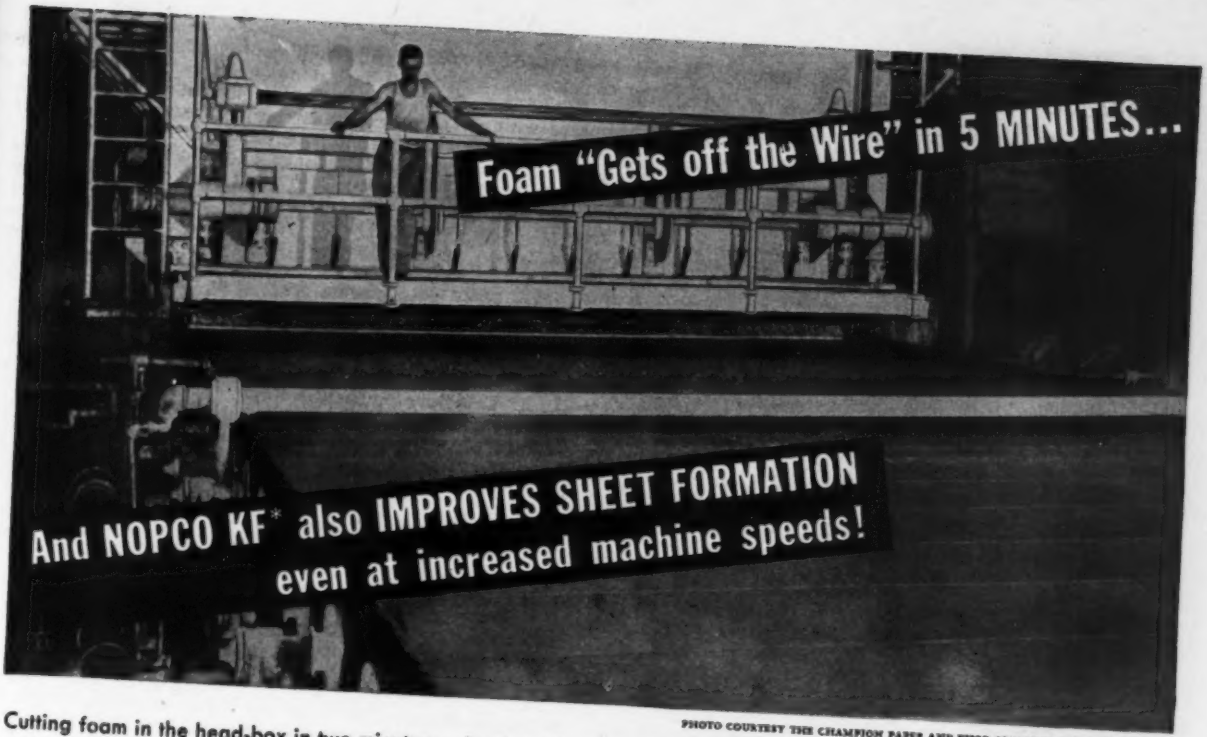


PHOTO COURTESY THE CHAMPION PAPER AND FIBRE COMPANY, HAMILTON, OHIO

Cutting foam in the head-box in two minutes—clearing all bubbles from the wire in five minutes—that's "all in the day's work" to NOPCO-KF, *super "bubble-buster."* Other advantages. *Improved sheet formation, due to better fiber dispersion and foam control . . . thin spots 75% eliminated* —their common cause (entrained air) dissipated as if stock were being handled at slow speeds, because NOPCO-KF keeps working on the wire . . . *more paper produced with less cleanups around the machine . . . breaks reduced . . . surface characteristics improved . . . water repellency materially increased.*

NATIONAL OIL PRODUCTS COMPANY
Boston • Chicago • HARRISON, N. J. • Cedartown, Ga. • Richmond, Calif.

NOPCO-KF

SUPER "BUBBLE-BUSTER"

BUT CAN I BUY IT?

Even though some NOPCO products are not now available in the desired volume, we are confident that the situation will gradually better itself. Meanwhile, we shall do our best to keep you informed of any developments. Here is a statement of the current situation on the NOPCO product advertised.

PRODUCT — NOPCO-KF

DELIVERY — Present customers' deliveries good, keeping pace with demands. Due to some tightness in raw materials, however, we are unable to accept new business at the moment, but are glad to submit samples for testing.

PRICE — Based on present costs of raw materials. Any decrease in such costs will immediately be reflected in our price.

OUTLOOK — Expect new installation to be completed in approximately 60 days. This will increase production facilities.

EVOLVED THROUGH RESEARCH NOPCO Reg. U. S. Pat. Off.

Westvaco Reports Its Earnings Doubled

NEW YORK, Feb. 19—While expressing confidence in the soundness of the industry as a whole, David L. Luke, Jr., President, last week reviewed earnings and plans of West Virginia Pulp and Paper Company at the annual meeting of stockholders in the company's main offices in New York City. Mr. Luke reported favorable rises in the company's earnings, sales and production for the first quarter of the current fiscal year and also reported that the company had entered into an agreement with four banks insuring $10,000,000 credit if needed during the next four years.

At a meeting following the stockholders session, the 13 directors of the company re-elected by the stockholders re-named all officers for the ensuing year. The officers are: David L. Luke, Jr., president; Sidney M. Phelan, Jr., William J. Bailey, Lawrence W. Strattner and James W. Towsen, vice-presidents; David Graham, treasurer; Lawrence J. Kavanagh, assistant treasurer; Charles A. Cass, secretary; Henry L. Condit, assistant secretary; Jotham R. Condit, comptroller, and Stuart W. McLaughlin, assistant comptroller.

Thomas Luke was re-named chairman of the board and Adam K. Luke was re-elected vice-chairman. Members of the executive committee are Thomas Luke, Adam K. Luke, David L. Luke, Jr., Paul B. Lacy, Sidney M. Phelan, Jr., and Thomas H. Stirling.

The directors declared a regular dividend of 25 cents and a special dividend of 25 cents per share on common stock, payable April 1, to holders of record on March 15.

Mr. Luke told the stockholders that the company had entered into the $10,000,000 agreement with the Irving Trust Company, Central Hanover Bank and Trust Company, National City Bank and Maryland Trust Company in December, 1946. No money has yet been borrowed under the agreement.

He explained that the agreement insures the company's ability to borrow up to $10,000,000 if and as required over the next four years. The loans, if made, will be amortized in ten years and will bear interest at the rate of 1¾ percent.

"We hope that satisfactory earnings and relatively stable economic conditions may mean that we will have no need for any borrowing," Mr. Luke pointed out.

The company will pay until December, 1950, a fee at the annual rate of ⅜ths of 1 percent on any unused portion of its commitment.

Mr. Luke likened the commitment commission to an insurance premium on the company's ability to obtain funds on favorable terms.

Earnings for the first quarter ended January 31 amounted to $2,210,622, equal to $2.45 per common share, after allowances for taxes and preferred dividends. This compared with $1,112,404 and $1.23 for the average quarter of the past fiscal year.

Production of paper and paperboard during the first quarter was 163,104 tons, as compared with the 1946 quarterly average of 149,496 tons.

Sales during the first quarter amounted to $20,188,589, as against the 1946 quarterly average of $16,802,982.

In reviewing the company's activities, Mr. Luke pointed out that the earnings for the fiscal year 1946 represented a return of 8.6 percent on the capital employed, compared with 3.9 percent for 1945 and an average of about 4½ percent over the past 20 years.

"We hope to be able to maintain relatively satisfactory earnings throughout the balance of the current fiscal year and for several years thereafter," he said, "so that we may gradually improve the long-term earnings record which none of us has considered satisfactory."

He attributed the relatively low rate of earnings on common stock over the past 20 years to the depressed economic conditions of the 1930's and the over-expansion of the industry during the 1920's and 1930's.

The over-expansion of the 1930's resulted from a large increase in the production of newsprint in Canada, he said, where water power and a large volume of spruce pulpwood was available. He laid the over-expansion of the 1930's to the migration of the kraft pulp industry to the south, where the attractions were a large supply of labor at low wage rates and a large volume of previously unexploited low cost pine pulpwood.

Another contributing factor was the disturbance of foreign exchange rates during the 1930's, Mr. Luke said. He explained that the depreciated currencies of Scandanavia, Finland and some continental countries made possible the importation of foreign pulp at prices below profitable levels for the domestic industry.

Mr. Luke said the industry can see no large reservoirs of low cost pulpwood available in the world except in Russia and that no large scale migration of the industry into a low-cost production area is expected.

"Because we cannot see any low-cost opportunities for over-expansion of our industry," he said, "we feel reasonable confidence in the fact that our industry now stands on a firmer foundation that it has for the past 20 years or more."

The president announced that the paper company expects to bring into operation during the third quarter a new paper machine at the Charleston, S. C., plant. Installation of this machine was originally planned when the Charleston plant was built during 1936 and 1937.

He said the company feels the machine will improve the balance of the Charleston operation and make the plant a more efficient production unit, with a better cost basis and a better profit potential.

Mr. Luke announced that the company also hopes to complete during the current fiscal year a large part of a $19,000,000 modernization and construction program which was begun shortly after the end of the war. This program is being carried out in all six of the company's plants.

He pointed out that one of the factors governing progress of the program is the high cost of construction, which is forcing the company to move slowly and cautiously in carrying out other contemplated construction. He said, however, that the company hopes that the work it expects to finish this year will contribute sufficiently to overall earnings to allow a reasonable degree of progress in carrying out future plans.

Marathon Names Geisler To Personnel Post

MENASHA, Wis. — Carl R. Geisler has been appointed director of the personnel division of Marathon Corporation. A native of Wausau, Mr. Geisler received his early education there. He was graduated from Wharton School of Commerce, University of Pennsylvania, and took graduate work at Harvard Business School.

A colonel during the war, he was officer in charge of personnel at the Philadelphia Quartermaster depot. The combined procurement and manufacturing operations of the Philadelphia depot employed more than 17,000 military and civilian persons in purchase and supply of army clothing and textiles.

Since leaving the army a year ago, Mr. Geisler was director of personnel for Hammermill Paper Company at Erie, Pa. His headquarters will be at the Menasha office of Marathon Corporation. He expects to move his family here in the near future.

Minnesota M. & M. Distributes Profit Bonus to Employes

WAUSAU, Wis.—The Wausau plant of the Minnesota Mining and Manufacturing Company, manufacturers of abrasive papers, has a profit-sharing plan under which 250 employes participated February 12 in the distribution for the fourth quarter ended December 31, 1946. The plan was established in 1936.

The amount distributed to each fully participating employe is equivalent to 8.8 percent of his regular earnings for the quarter. Employes not participating fully receive proportionate amounts, based on length of service.

The quarterly distribution at all plants and offices of the company is about $230,000. More than five thousand employes are participating.

Every Tree Counts for More Pulpwood

Mall Gasoline Engine Chain Saw.
Available in many cutting capacities.

The man bucking with the new Mall Bow Chain Saw.

Pulpwood formerly wasted in high stumps now goes to the mill—when trees are felled with a Mall Gasoline Engine Chain Saw. This modern power saw cuts within inches of the ground, thereby adding extra lumber to every length. It is fast . . . accurate . . . has automatic stall-proof clutch . . . can be carried anywhere a man can walk. Clean, smooth cuts make log ends easy to identify. *Immediately available* in 24, 36 and 48 inch capacities.

NEW MALL BOW CHAIN SAW DESIGNED ESPECIALLY FOR THE PULPWOOD FIELD

The new Mall Bow Chain Saw adapts the speed, power and facility of the Mall Chain Saw to the felling, bucking and limbing of small diameter trees. Its bow-shaped chain guide plate eliminates jamming and pinching of chain in cut. Lightweight and easy to handle—it can be operated by one man with no previous mechanical experience after only a few instructions.

The Mall Bow Chain Saw (18″ capacity) is available in 3 ways:

1. **As a replacement for the straight guide plate and chain on the Mall Chain Saw you already own—converting it into a Mall Bow Chain Saw.**
2. **As an interchangeable attachment for the Mall Chain Saw—providing two types of saw from only one motor unit.**
3. **As a completely new unit—equipped with a 6 H.P. 2-stroke Gasoline Engine.**

Write for name of nearest distributor. Demonstrations can be arranged.

MALL TOOL COMPANY
7788 South Chicago Avenue, Chicago 19, Ill.
See our advertisement in *The Saturday Evening Post* April 5th Issue.

IMPORTS

NEW YORK IMPORTS

WEEK ENDING FEBRUARY 22, 1947

Wall Paper .....1 crate, 16 cs.
Carbon Paper .....1 crate
Tracing Cloth .....78 cs.
Drawing Paper .....40 cs.
Miscellaneous Paper ..... 1 cs.

WALLPAPER

Hudson Shipping Co., Durango Victory, Liverpool, 1 crate.
W. J. Jones & Co., American Ranger, Havre, 16 cs.

CARBON PAPER

Mynol Chemical Co., Durango Victory, Liverpool, 1 crate.

TRACING CLOTH

Defender Sales Co., Durango Victory, Liverpool, 3 cs.
Keuffel & Esser Co., Durango Victory, Liverpool, 75 cs. (bleached cotton).

DRAWING PAPER

Emile Gallet, American Farmer, Havre, 31 cs.
Stevens Nelson Paper Corp., American Farmer, Havre, 9 cs.

MISCELLANEOUS PAPER

International Expediters, Goonawarra, Stockholm, 1 cs.

RAGS, BAGGINGS, ETC.

A. W. Fenton Co., Hobart Victory, Genoa, 180 bls. dark cotton rags.
Textile Paper & Supply Corp., Hobart Victory, Genoa, 45 bls. dark cotton rags.
Amicale Trading Co., Hobart Victory, Genoa, 62 bls. old dark cotton rags.
Amicale Woolstock Service, Hobart Victory, Genoa, 309 bls. dark cotton rags.
(———), Hobart Victory, Genoa, 2 bls. dark cotton rags.
United Textile Co., Hobart Victory, Bombay, 43 bls. cotton waste.
Volkart Bros., Hobart Victory, Bombay, 200 bls. cotton waste.
New England Waste Co., Hobart Victory, Bombay, 600 bls. cotton waste.
Schimmel Trading Corp., Hobart Victory, Bombay, 153 bls. cotton waste.
Riverside Mills, Hobart Victory, Bombay, 99 bls. cotton waste.
Padawer Corp., Hobart Victory, Bombay, 90 bls. cotton waste.
O'Brien Products, Inc., Gertrude Maersk, Shanghai, 250 bls. cotton waste.
Empire Fibre Co., Gertrude Maersk, Shanghai, 100 bls. cotton waste.
Williamson Northrup Co., Gertrude Maersk, Shanghai, 200 bls. cotton waste.
Riverside Mills, Derrycunihy, Bombay, 200 bls. cotton waste.
New England Waste Co., Derrycunihy, Bombay, 1072 bls. cotton waste.
Lush Cotton Products Co., Derrycunihy, Bombay, 100 bls. cotton waste.
Continental Bank Trust Co., Derrycunihy, Bombay, 2500 bls. hemp net cuttings.
National City Bank, Derrycunihy, Bombay, 2833 bls. hemp net cuttings.
Chase National Bank, Derrycunihy, Bombay, 1175 bls. hemp net cuttings.
Continental Bank Trust Co., Stag Hound, Shanghai, 100 bls. cotton waste.
S. H. Waldestein, Mormacswan, Santos, 35 bls. cotton waste.
J. Eisenberg, Kaikoura, Dunedin, 6 bls. wool rags; 6 bls. wool waste.
E. J. Keller Co., Inc., Exporter, Haifa, 175 bls. khaki cotton rags.
E. J. Keller Co., Inc., Exporter, Alexandria, 130 bls. old white rags; 15 bls. new cuttings; 14 bls. new colored rags.
Continental Bank Trust Co., White Swallow, Santos, 38 bls. flaxwaste.
Irving Trust Co., White Swallow, Rio de Janiero, 139 bls. cotton waste.
Padawer Corp., White Swallow, Rio de Janiero, 240 bls. cotton waste.
New England Waste Co., White Swallow, Rio de Janiero, 407 bls. cotton linters.

WOODPULP

Price & Pierce, Ltd., Stavangerfjord, Sarpsborg, 750 lbs. prime bleached sulphite pulp, 151 tons.
Stora Kopparberg Corp., Goonawarra, Skutskar, 1479 bls. dry woodpulp.

GLUESTOCK, ETC.

Darmstadt Scott & Courtney, Herdis, Buenos Aires, 435 bags dry gluestock.
John Gorvers, Herdis, Buenos Aires, 50 bags dry gluestock.
Irving Trust Co., Durango Victory, Liverpool, 153 bags hidecuttings.
Transatlantic Animal By-Products, Wild Rover, Rio Grande, 1779 bags boneglue.

CASEIN

American British Chemical Supplies, White Swallow, Buenos Aires, 2500 bags.
J. H. Schroeder Banking Corp., Lalande, Buenos Aires, 1000 bags lactic casein.
Bank of London & South America, Lalande, Buenos Aires, 2000 bags lactic casein.
National City Bank, Lalande, Buenos Aires, 3500 bags lactic casein.
(———), Herdis, Buenos Aires, 300 bags lactic casein.
Bankers Trust Co., Herdis, Buenos Aires, 500 bags lactic casein.
J. H. Schroeder Banking Corp., Herdis, Buenos Aires, 500 bags lactic casein.

BOSTON IMPORTS

WEEK ENDING FEBRUARY 22, 1947

John Gorvers, White Swallow, Santos, 67 bls. gluestock.

Exporters Pick Strub As Their President

NEW YORK—J. Francis Strub, vice-president of Parsons & Whittemore, Inc., was elected to the presidency of the United States Paper Exporters Council, Inc., at its annual meeting held late last week. Mr. Strub succeeds Adalbert Greiner, president of China American Paper & Pulp Company, Inc., who reported progress during the past year in obtaining recognition from paper mills of the fact that the Council's members have rendered important service to the paper manufacturing industry in this country. However, Mr. Greiner emphasized the need for active functioning by the World Bank in the stabilization of the currencies of other countries and stated that exports of paper from this country as well as all American exports are directly related to that problem. Mr. Strub foresaw the need for cooperation with other foreign trade associations in assisting American manufacturers and distributors to obtain their rightful place in world trade.

The Council also elected Harry Bengtsson, president of Benex Corporation, as its vice-president, and re-elected Kenneth W. Lathan, vice-president of Moller & Rothe, Inc., as its secretary-treasurer.

Elected to the new board of directors, in addition to Mr. Greiner, the retiring president, were Johannes Van Reekum, vice-president of Van Reekum Paper, Inc.; James F. Capen, Jr., president of A. M. Capen's Sons, Inc.; and John C. Penton, export manager of McLaurin-Jones Company.

Deny Intent to Close Ogdensburg Plant

OGDENSBURG, N. Y.—Rumors that the Ogdensburg division of the Cleveland Container company would close down in the immediate future were declared to have no foundation by Gerald W. Mulder, general chairman of the branch.

"The Ogdensburg branch of the Cleveland Container company intends to remain here permanently to the best of my knowledge," Mr. Mulder stated, and declared that he could think of no reason for the report.

Citing the recent three-cent per hour pay raise for employes and the newly instituted check-off system which were contracted between the Cleveland, O., headquarters and the local branch recently, he pointed out a statement made following contract negotiations by Floyd C. Van Deusen, international representative, in referring to the harmony between the two divisions.

R. B. Robertson Reelected By Am. Paper & Pulp Assn.

(Continued from page 43)

veys, as well as the usual statistical reports on production and sales.

"The staff of the Association eagerly desires to make both present and future studies responsive to the needs of the members and invites suggestion and comment.

"The Nation is now emerging from the reconversion period and we are now less subject to imposed controls and to a greater extent masters of our own destinies than has been the case for many years.

"We cherish the benefits of free enterprise, but must bear in mind that enterprise cannot be so free as to escape social responsibility. We must think not only in terms of our own needs and of Industry needs but National needs as well.

"The Nation will not be well served, and we will not fully satisfy our obligations, if the Industry fails to supply public needs now and in the future because of short sightedness in the matter of supply of essential materials for the long time outlook.

"As we all know, woodpulp is the corner-stone on which our papermaking structure has been built and we cannot make woodpulp without wood. Permanent supplies of wood in this country are of great concern to integrated and converter mills alike.

"We cannot forget that wise use calls for treating our forests as farms with everlasting crops rather than as mines with non-recurring harvests.

"Wartime use as well as postwar demands for lumber accompanied by the shortage of suitable saw log stumpage has invited the saw mill operators into cutting practices that deprive pulpwood producers of diameter limits which formerly were considered as appropriated to pulpwood production.

"It seems certain that for many years to come the pulpwood consumer will have to adjust himself to operations based on more widely scattered stands of timber, fewer cords per acre, and longer hauls, all of which mean that the days of cheap pulpwood have gone—never to return. It is interesting to recall that a few of the early Southern mills had visions of delivered prices of pulpwood of about $4.00 per cord extending through the years.

"Hereafter it will be increasingly important that we adapt our processing of wood to the more complete utilization of logging wastes, saw mill wastes, and of varieties of trees that have little value for the competitive user of forest products.

"Increased population, higher standards of living, new uses for paper, and an accumulated back log of unsatisfied demand, point to the need of increased paper and pulp production. Certainly no new mills should be established without complete assurance of an adequate and continuing supply of this basic raw material. We must distinguish between what seems to be available and what is actually available for pulp mill use.

"Our Forestry Committee has recommended that wood users apply the same engineering care and foresight to the problem of adequacy of wood supply as is given to the design and construction of the mills themselves.

"It is to be expected that our Government will be concerned with the conservation and wise use of all natural resources. It is our very earnest hope that this concern as to our forest will find expression in advisory rather than mandatory relationships.

"Our Association endeavors to maintain close and intimate liaison with Governmental agencies so that it can offer a maximum of cooperation when feasible programs are advocated. The Department of Commerce has taken the initiative in inviting cooperation through the use of Industry Councils. The first of these councils was created for the Pulp and Paper Industry. It is just now beginning to function. We are confident that the relationship will be constructive and helpful.

"Our experiences during the war emphasized the fact that no segment of the Paper Industry can suffer economic hardship without an impact on the entire Industry. It is important that we develop and maintain an overall industry conscienousness that will fully recognize this essential interdependency. We are in a measure our Brother's Keeper—Our Association should be especially helpful in this field.

"The pulp and paper industry can review with pride its production record for the year 1946, and we can look forward with confidence to a similar record for 1947. We know, however, that some of our customers have not been satisfied because of the substantial spread between what they hoped to get and what the Industry was able to supply.

"Our industry is in large measure a world industry and cannot isolate itself from the problems of other nations. Europe's economic confusion has resulted in a diversion of imports of woodpulp to other outlets and away from mills in this country. The hundreds of thousands of tons involved have had a material bearing on production rates in this country, and no one can prophesy with confidence as to how long this condition will continue.

"High demand and accumulated shortages have brought into being a seller's market for pulp and paper products. It is a temptation to "Get while getting's good," but a seller's market always involves danger. Danger of over-expansion, over-pricing, and of excessive wage structures. We know by experience that profits tend to be far more unstable than increased costs. High costs have a most painful stability. It is a time for caution and restraint. A pronounced inflationary trend invites a resumption of the government controls from which we have but recently been relieved. When restraints are needed it is far better to have them self-imposed and voluntary rather than mandatory.

"We are all interested in the problems of industrial relationships, the problems of men and management. It now seems certain that in spite of our labor leaders' assurance of an intent to be good in the future legislative controls will be set up by Congress designed to check labor's excesses and its abuse of power.

"It would be a mistake, however, to believe that industrial peace can be brought about by the single expedient of passing a law—that will require constructive policies based on sound human relationship.

"Now that we have a Congress that seems to have the courage to meet squarely the problem of labor responsibility, it would be but natural for some employers to press for laws that would not only be regulative but actually punitive.

"Such a course would be a very human response to the long period of aggressions which management has endured at the hands of politicians subservient to labor. Having been kicked about, some on the management side could readily enjoy a little kicking about on their own account.

"Labor may be somewhat chastened but it is a long way from being prostrate or without influence in national affairs.

"Industry has before it the opportunity to prove the truth of the policy of inevitable cooperation between men and management and the falsity of the doctrine of inevitable conflict.

"Wise handling of the present situation can readily result in the creation of better and more productive relationships between men and management than have existed in more than a decade.

"In conclusion I would like to express the appreciation of the American Paper and Pulp Industry for the understanding and cooperation we have received from the Canadian Industry. It is my hope that these friendly relationships can be maintained and enlarged through close working relationships with the Canadian Pulp and Paper Association in the future. I would like to thank the Industry as a whole for its continued support of the American Paper and Pulp Association and I would like particularly to thank the 260 members of the active committees who spend so much time and effort in the general cause of the Industry's welfare. I think I would be derelict in my duty if I did not mention in particular the recent presentation before the Committee for Reciprocity Information by Cola G. Parker, which is illustrative of the kind of service rendered to the entire industry by many executives.

"We have come to take for granted the effective functioning of the staff of the American Paper and Pulp Association and I am happy to say we have not been disappointed."

MARKETS

Principal chemicals purchased by the pulp and paper industry are likely to remain in limited supply through much of 1947 according to reports issued by the Department of Commerce. Demand for chlorine exceeds available supplies. Some new capacity may be in operation in 1947, easing the situation but not affording full relief. Soda ash currently in sight is about fifteen percent short of meeting requirements. England, which was formerly one of the world's largest producers, is not yet back into normal production. In the United States, soda ash is expected to remain tight for at least a year. Salt cake and sodium silicate will probably be fairly adequate for most of 1947. Germany was one of the major world producers before the war, but it will be some time before that country is able to meet export demands on its output.

Corn starch supplies will be ample in 1947 as the corn wet milling industry is grinding at 100 percent of capacity. Shipments of tapioca from the Netherlands Indies can be expected to improve in the coming year.

Supplies of casein, currently short, are expected to show improvement during 1947, owing to a larger domestic output and increased imports from Argentina.

Rosin supplies, which have been depleted for some time, are expected to improve considerably after the Spring as a result of good crop expectations as well as increased output of wood rosin. Synthetic resins are encountering tremendous demands from the plastic and paint industries and will probably continue in tight supply for most of 1947. Aluminum sulphate is expected to be adequate. Printing inks, as used by numerous paper converters as well as the printing and publishing industry, will remain tight, since drying oils to a large degree are imported and no great improvement in supplies is foreseen. The pigment supply situation should ease, except that for titanium dioxide, which is expected to continue short through 1947.

Blanc Fixe—Supplies of blanc fixe during the first half of 1946 were adequate to take care of moderate consumer demands. In the last half of 1946 production was hampered by raw materials shortages. Demand, meanwhile, increased and prices went up approximately 5 percent. Outlook for 1947 is good, however, and production is expected to be adequate to meet most demands. Current quotations are $55 per ton for pulp in barrels, f.o.b. car lots at works; and $67.50 per ton for powder in car lots f.o.b. works.

Bleaching Powder—Demand for bleaching powder during 1946 was active with a favorable supply situation prevailing to satisfy most consumers. Production in 1947 is expected to be sufficient to cover the needs of the paper industry. Currently bleaching powder in drums ranges from $2.65 to $3.35 per 100 pounds, car lots, at works.

Casein—Casein was extremely tight throughout 1946. Prices ranged all the way from 24 cents to 60 cents per pound. Production of domestic dry casein in 1946 was estimated at 18,175,000 pounds, an increase of 53 percent over 1945, but 46 percent less than the 1940-44 average. High prices have diverted increased amounts of skimmed milk and powdered milk to the casein industry. Outlook for 1947 is promising with domestic production expected to reach new record highs. Imports from Argentina are expected to improve once Argentina is able to cease shipping its edible milk products abroad for famine relief.

Caustic Soda—Supplies of caustic soda were critical all through 1946. Demand was heavier than usual while production fell below that of 1944 and 1945. Trade reports indicate current production is under contract for 1947. Unless demand eases up considerably there is little prospect of a free market opening up in 1947. Quotations on solid caustic soda are reported at about $2.50 per 100 pounds; flaked and ground are currently offered at $2.90 to $3 per 100 pounds f.o.b. car lots at works.

China Clay — Demand for china clay was fairly steady in 1946 with supplies tight most of the time. Outlook for 1947 is fair with prospects of increased domestic production and increases in foreign supplies. Domestic filler clay is currently $8.50 to $9 per ton, car lot. Coating clay is $12 car lot and $16 less car lot. Imported clay is $20 to $22 per ton car lot, export warehouse; and $45 less car lot, export warehouse for powdered clay.

Chlorine—Reports indicate production of chlorine in 1946 showed progressive increases although average monthly rates were below that of 1945. For the most part of 1946 demand exceeded supplies and the market position remained definitely tight. Hope is expressed for some relief in the supply situation in the latter part of 1947, meanwhile, the tankcar and container shortage continues to hamper shipments from manufacturing plants. Chlorine is currently quoted at $2 per 100 pounds in single unit tank cars and $2.25 for multiple unit cars, f.o.b. at works.

Rosin—Supplies of low grade gum rosin were adequate to meet demand during most of 1946. Demand for high grades of WW, WG and X, on the other hand, far exceeded supply. The situation has not changed much to date except that prices are becoming increasingly higher as demand for export stocks continue to grow. Currently gum rosin in drums, per 100 pounds net in car lots, at New York is $10.80 for B and D grades; $11.80 for E through N; and $12.05 for WG and WW grades.

Salt Cake—Demand for salt cake increased in the latter part of 1946 and with it prices went above the $20 level. Production is expected to meet most over-all demands in 1947. Currently domestic salt cake is quoted at from $22 to $24 per ton in bulk. Chrome cake remains $16 per ton.

Soda Ash—Demand has been running ahead of supply with the deficit for the year 1946 estimated at 500,000 tons despite the fact the industry operated at a capacity rate of 4,500,000 tons last year. Consumers are still asking for more soda ash than can be produced under the industry's present full capacity. Outlook would seem to indicate a tight supply situation for an indefinite period. Current prices in car lots per 100 pounds are $1.05 in bulk; $1.20 in paper bags and $1.60 in barrels.

Starch—Production of starch in 1946 was sufficient to meet the needs of the paper industry. Indications point to a continued steady market in 1947. Current quotations are $3.62 per 100 pounds for the pearl grade, and $3.73 for powdered, in car lots f.o.b. Chicago.

Sulphate of Alumina — Demand for sulphate of alumina through all of 1946 was active with supplies generally in fair balance. Improvement in the supply situation is expected early in 1947. Commercial grades

are currently quoted at from $1.15 to $1.20 per 100 pounds, in bags, car lots f.o.b. at works. Iron free sulphate of alumina is currently $1.75 to $2 per 100 pounds in bags, car lot quantities at works.

SULPHUR—Stocks of sulphur accumulated during the earlier part of 1946 were sufficient to meet demands for the entire year. Supplies for 1947 indicate another steady market. Currently annual contracts are quoted at $16 per ton f.o.b. mines; the price f.o.b. at Gulf Ports is $20 per long ton in car lots.

TALC—Demand for talc in 1946 was fairly active with supplies relatively short. Currently domestic and French grades are moving in fair volume with prices steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $35 to $45 per ton. All prices in car lots.

FIBROUS WASTE MATERIALS

PAPER

Reports from within the trade and from Department of Commerce field observers indicate that waste paper will increase in importance in 1947. Total waste paper receipts in 1946 were well in excess of 7 million pounds. Consumption during 1946 averaged 610,694 tons monthly; while receipts averaged about 630,906 tons a month. Continuation throughout 1947 of the high levels attained since the spring of 1944 is believed possible. Increased potential waste paper supplies due to an enlarged 1947 production of paper and board will be available for collection. Estimates for 1947, indicate waste paper requirements of approximately 7,700,000 tons with receipts expected to substantially exceed that figure. Barring a serious upset in paper production these figures are believed realistic even though they do anticipate expansion of collection efforts.

With a steady paper mill demand that is believed capable of absorbing practically all offerings, indications point to 1947 as another big year for waste paper collections. Supplies of recoverable paper will be at new high levels. There is a keener and more widespread public appreciation of the significance of waste paper and the profitable rewards of collection. Certain of the country's most productive waste paper centers, such as New York City, are introducing improved methods and apparatus for waste paper salvage. All eight of New York City's incinerators are now equipped to salvage waste paper. The Eastern Conservation Committee of the Waste Paper Consuming Industries reports that the last incinerator to be equipped with the double-belt conveyor system is expected to add another 150 tons of waste paper to the weekly total of about 2,000 being redeemed at seven other plants. Before these installations were made this waste paper had been burned.

Industry sponsored 'drives" in selected areas, following methods first inspired by the emergency wartime needs, are developing techniques for stimulating and improving waste paper collections. In each of the areas reporting such drives closer cooperation is reported between mills and dealers looking toward solutions of their mutual problems, and enabling dealers to keep informed of specific mill requirements. Another accomplishment of these campaigns is the assistance furnished to dealers to obtain baling equipment and improve their baling capacity, thus alleviating the awkward problems of storage. Paper mills, however, still look to dealers as their permanent and chief source of supply, but they in turn will depend upon the individual or organized groups as an important source of collections.

Exports of waste paper amounting during 1946 to less than 0.8 percent of total waste paper receipts throughtout the country are not expected to be a significant factor in the 1947 supply situation, although a moderate increase in exports may be anticipated. Of the 1946 shipments out of the country, about 20 percent were over-issue, the remainder consisting of old newspapers and all other grades.

WASTE PAPER

United States Estimated Supply and Requirements 1946-1947
(1,000 short tons)

	1946	1947
Supply (total)	7,470	7,800
Requirements (total) (1)	7,240	7,600
Apparent surplus (+) or deficit (—) (total) (2)	+230	+200

(1) Requirements based upon estimated paper and paperboard production; do not include inventory accumulation.
(2) Represents estimated inventory accumulation.
Source: Estimated by Pulp and Paper Unit, Office of Domestic Commerce.

RAGS

Any marked improvement during 1947 in the current tight supply of new cotton rags will probably have to await a definite and substantial upswing in the textile industry. Meanwhile, manufacturers of fine papers will continue the substitution of cotton to make up for the lack of new rags of cotton and linen. Some increases as to the prices of rags in these categories may be expected during the forthcoming year.

Reports indicate that rag content paper mills will probably buy ungraded market cotton in quantity this year. Since ungraded cotton is not used in the textile industry and normally compares favorably pricewise with new cotton cuttings, such continued use is very plausible. Rag content mills have recently been using quite a bit of new lint cotton anyway. Plans now call for a purchasing representative to locate in western Texas, and also the possibility of growing cotton on leased or purchased land for use in papermaking. The program, however, is hardly further than the blueprint stage, and is not expected to be in full operation for several years yet.

Old rags which form a substantial portion of the component materials of building papers, the group utilizing nearly 70 percent of the total quantity of rags consumed by the paper and board industry, may be in somewhat better supply in 1947. Whatever improvement develops will probably take place in imports, which have increased from an average of 3,585 tons annually in the three years 1943-45 to a 1946 total of more than 15,000 tons. While import statistics do not segregate old rags, the stated value indicates that the preponderance are in this category.

Before the war, the United States brought in from Europe, the Near East, Japan, Latin America and other regions, quantities of rags that made up, in 1939 for example, about 12 percent of this country's total rag consumption. Total imports fell off from 122,000 tons in 1937 and 57,240 tons in 1939 to the recent annual figures mentioned above. The improvement shown by the 1946 total as compared with previous recent years indicates that foreign shippers are again becoming an important factor in the supply of rags for domestic paper makers.

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume of business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—

Roll, contract	$84.00	@	—
Sheets	103.00	"	—

Kraft—per cwt.—Carload Quantities Zone A, Delivered 40 lb. base weight

Superstandard Wrapping	$6.25	@	$6.50
No. 1 Wrapping.	6.00	"	6.25
Standard Wrapping	5.25	"	6.00
Standard Bag	5.25	"	6.00

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd.	1.10	@	1.20
Wh. No. 1 M. G.	1.10	@	1.20
Wh. No. 1½	.95	@	1.10
Wh. No. 2	1.00	@	1.10
Wh. Anti-Tar.	2.25	@	3.50
Kraft Unbl.	1.15	@	1.25
Manila No. 2	.90	@	1.05

Toilet—Per Case of 100 rolls 1 M Sheets.

Unbleached	4.47	@	5.50
Bleached	6.50	"	—

Paper Towels — Per Case of 3750 Zone 1.

Wh. C. fold 11x13⅜	4.09	@	—
Br. Sgl. fold 10 in.	2.37	"	2.48
Br. M'tif'd 9½x14¾	3.48	"	—
Br. M'tif'd 9½x9¾	2.37	"	2.48

Manila—per cwt.—C. l. f. a.

No. 1 Jute	11.25	@	—
No. 1 Manila 35 lb.	6.00	"	7.00

Boards, per ton—

News	*70.00	@	75.00
Chip	*67.50	"	73.00
Sgl. Mla. Lt Chip	*80.00	"	89.00
White Pat. Coated	*86.00	"	101.50
Kraft Liners 42 lb.	*84.00	"	100.00
Binders Boards	94.00	"	126.00

Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—White, Assorted Items

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.75 @ $46.75		$40.90 @ $48.00
100% Rag.	32.85 " 38.50		34.00 " 40.00
85% Rag	.... "		30.55 " 38.75
75% Rag	24.30 " 28.50		24.45 " 30.00
65% Rag	.... "		.... " ....
50% Rag	20.05 " 24.50		21.25 " 25.75
25% Rag	17.85 " 21.75		19.00 " 23.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers.. White, Assorted Items

	Bonds	Ledgers
No. 1	$12.00 @ $14.50	$13.15 @ $16.00
No. 2	11.25 " 13.75	12.25 " 15.00
No. 3	.... "	.... " ....
No. 4	10.60 " 13.00	11.75 " 14.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper

No. 1 Glossy Coated	$14.70 @	$16.75
No. 2 Glossy Coated	13.75 "	15.50
No. 3 Glossy Coated	13.20 "	16.00
No. 4 Glossy Coated	12.00 "	14.90
No. 1 Antique (Watermarked)	11.35 "	12.75
No. 2 Offset	10.65 "	12.25
A Grade E. F.	10.60 "	12.00
A Grade S. & S. C.	11.00 "	12.50
B Grade E. F.	10.30 "	11.75
B Grade S. C.	10.70 "	12.25
C Grade E. F.	10.00 "	11.50
C Grade S. C.	10.40 "	12.00
D Grade E. F.	9.70 "	11.00
D Grade S. & S. C.	10.10 "	11.50

Ivory & India at $.50 cwt. extra.

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short ADT
Groundwood	$75.00 to —
Unbleached Sulphite	105.00 " —
Bleached Sulphite	115.00 " 122.50
Bleached Soda	105.00 " 115.00
Unbleached Kraft	102.50 " —
Southern Kraft	90.00 " 102.50

Canadian mill prices delivered with freight allowances of $7.50 per ADT; unless otherwise specified:

	Per Short ADT
Regular Kraft	$102.50 to —
Select Unbleached Kraft (no freight allowance)	105.00 " —
Unbleached Sulphite	105.00 " —
Glassine Unbleached Sulphite (no freight allowance)	102.50 " —
Bleached Soda	105.00 " 115.00
Groundwood	75.00 " 80.00
Sideruns Pulping News	75.00 " —
Hardwood and Specialty Grades	Nominal

Swedish wood pulp prices, per ton of 2,000 lbs. air dry weight on dock usual Atlantic and Gulf ports with an average freight cost of about $9.00 per short ton included. Subject to change as it is said these prices are not satisfactory to Swedish producers:

	Per Short ADT
Bleached Sulphite	$120.00
Bleached Kraft	126.00
Unbleached Sulphite	95.00
Unbleached Kraft	89.00

Finnish quotations ex. dock, New York

	Per Short ADT
Bleached Sulphite	$165.00
Unbleached Sulphite	132.50
Unbleached Sulphite (special grade)	137.50
Unbleached Sulphate	132.50
Unbleached Sulphate (special grade)	159.00

Other European countries, at the present time, are not quoting on prompt and forward deliveries of wood pulp, because they have no tonnage available for export.

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50 to		$12.00
Light Silesias	7.50		
Unbleached Muslin	11.50	"	12.00
White Back Blue Overalls	8.25		
Blue Overalls	7.75		
Unbl. Fancy Shirt	4.50	"	5.00
Light Percales	5.50	"	6.00
Light Prints	5.25	"	5.95
Washables	4.00		
Bleachable Khaki	5.50	"	6.00
Unbleachable Khaki	5.00	"	5.50
Cottonades	4.50	"	5.00

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$5.00
No. 1 Whites Miscellaneous	4.25
No. 2 Whites Repacked	4.00
No. 2 Whites Miscellaneous	3.50
Blue Overalls	3.75
Thirds and Blues Repacked	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags	2.20
No. 2 Roofing Rags	2.10
No. 3 Jute Bagging	2.00
No. 4 Brussels and hard back carpets	2.00
No. 5A Roofing Rags	2.00

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.
New Dark Cuttings	$6.00 to ....
New Mixed Cuttings	6.50 " ....
Light Silesias	9.00 " 10.00
Light Flannelettes	8.00 " 9.00
New White Cuttings	13.00 " 15.00
Fancy Shirt Cuttings	9.00 " 10.00
Light Prints	8.00 " 10.00
Bleachable Khaki, No. 1	7.00 " 7.50
Unbl. Khaki, No. 1	6.25 " 6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.
No. 1 White Linens	$14.00 to 16.00
No. 2 White Linens	12.00 " 13.00
No. 3 White Linens	8.00 " 9.00
No. 4 White Linens	8.00 " 9.00
No. 1 White Cottons	10.00 " 12.00
No. 2 White Cottons	8.00 " 9.00
No. 3 White Cottons	6.50 " 7.00
No. 4 White Cottons	5.00 " 5.50
Extra Light Prints	7.50 " 8.00
No. 1 New Light Prints	6.25 " 6.75
Med. Light Prints	5.25 " 5.75
Dutch Blue Cottons	5.25 " 5.50
Checks and Blues	4.00 " 4.25
Linsey Garments	4.50 " 5.00
Dark Cottons	3.75 " 4.00
Old Shopperies	3.25 " 3.50
New Shopperies	3.25 " 3.50

BAGGING

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$4.75 to 5.00
Domestic Gunny, No. 1	4.25 " 4.50
Light Wool Tares	4.50 " 4.75
Heavy Wool Tares	4.75 " 5.00
Bright Bagging	4.25 " 4.50
Foreign Manila Rope	6.00 " 7.00
Domestic Manila Rope	5.75 " ....
Jute Strings	4.50 " 5.00
No. 1 Sisal Strings	4.00 " 4.50
Mixed Strings	1.75 " ....

Waste Paper

Prices to Mills

(Dollars Per Ton)

F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00 @ $120.00
No. 1 Hard White Envelope Cuts	90.00 " 100.00
No. 1 Hard White Shavings, unruled	100.00 " 110.00
No. 1 Hard White Shavings, ruled	80.00 " 90.00
Soft White Shavings, one cut	95.00 " 105.00
No. 1 Soft White Shavings	85.00 " 95.00
Soft White Shavings, Misc.	65.00 " 75.00
No. 1 Fly Leaf Shavings	55.00 " 60.00
No. 2 Fly Leaf Shavings	50.00 " 55.00
No. 1 Groundwood Fly Leaf Shavings	30.00 " 33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)
Mixed Colored Shavings	(nominal)
Mixed Groundwood Colored Shavings	(nominal)
Overissue Magazines	(nominal)
No. 1 Heavy Books & Magazines	40.00 " 45.00
Mixed Books	22.00 " 25.00
No. 1 White Ledger	70.00 " 80.00
No. 2 Mixed Ledger, colored	60.00 " 70.00
New Manila Envelope Cuttings, one cut	100.00 " 110.00
New Manila Envelope Cuttings	65.00 " 75.00
Extra Manilas	40.00 " 45.00
Mixed Kraft, Env. & Bag Cuttings	75.00 " 85.00
Kraft Envelope Cuttings	100.00 " 105.00
Triple Sorted, No. 1 Brown Soft Kraft	70.00 " 75.00
New 100% Kraft Corrugated Cuttings	70.00 " 75.00
No. 1 Assorted Old Kraft	40.00 " 50.00
New Jute Corrugated Cuttings	27.00 " —
Old 100% Kraft Corrugated Containers	(nominal)
No. 1 News	26.00 " 27.00
No. 1 Mixed Paper	19.00 " 21.00
Box Board Cuttings	23.00 " —
White Blank News	75.00 " 80.00
Overissue News	(nominal)
Old Corrugated	28.00 " 30.00
Mill Wrappers	22.00 " 25.00

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—India	.26	@	.29
Fine Polished—Fine India	.31	"	.35
Unpolished—			
Paper Makers	.20	"	.26
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33½
Cotton	.70	"	—
(Hard Fiber)			
Mex. Sisal	.21	"	.24
Manila	.33	"	—
(Hemp)			
Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¼
Light Silesias	.05¼
Black Silesias, soft	.03¼
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—Acording to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04½
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	to	4.00
Mixed White	3.50	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	2.50
Repacked	2.20	"	—
Roofing Stock—			
Foreign No. 1	1.85	"	—
Domestic No. 1	1.75	"	—
Domestic No. 2	1.65	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	to	3.50
No. 1 Clean Bright—			
Sisal Strings	.04	"	—
No. 2 Clean Bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.85
Wool Tares, heavy	4.00	"	4.25

No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$115.00
No. 1 Hard White Shavings, unruled	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News	45.00	"	50.00
Soft White Shavings, Misc.	65.00	"	70.00
No. 1 White Ledger	52.00	"	55.00
No. 2 Ledger, colored	42.00	"	45.00
No. 1 Heavy Books & Magazines	38.50	"	40.00
Overissue Magazines	nominal		
New Manila Envelope Cuttings	65.00	"	75.00
No. 1 Assorted Old Kraft	40.00	"	—
No. 1 Mixed Paper	19.00	"	21.00
Box Board Cuttings	23.00	"	25.00
Kraft Corrugated Cuttings	nominal		
Old Corrugated	28.00	"	30.00
Overissue News	35.00	"	—
No. 1 News	26.00	"	30.00

BOSTON

Old Papers

(F. o. b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled	7.00	@	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Mis.	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	—	"	1.40
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	5.00	@	—
Domestic	5.00	"	5.12½
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	4.75	"	5.00
Domestic	5.00	"	5.25
South America	5.25	"	—
Wool Tares—			
Foreign	4.50	"	—
Domestic	4.50	"	—
Aust. Wool Pouches	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.06	@	.06½
Fancy Percales	.04¼	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.09½	"	.10
Canton Flannels, Bleached	.11	"	.12
Underwear Cutters, Bleached	.12	"	.13
Underwear Cutters, Unbleached	.11	"	.12
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03¼
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.11½	"	.12
Blue Cheviots	.05½	"	.06½
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.06	"	.07
O. D. Khaki	.06	"	.06¼
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.12½	"	.13

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.90	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	@	$120.00
No. 1 Hard White Shavings, unruled	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	38.00	"	42.00
No. 1 News	30.00	"	—
No. 1 Mixed Paper	19.00	"	20.00
Old Corrugated	33.00	"	—
Mill Wrappers	25.00	"	29.00

Paper Mill Operating Executives who are

INTERESTED

. . . in Increasing the Output of Paper Machines

. . . in Improving the Quality of Products

. . . in Eliminating B.T.U. Waste

. . . in Cutting Steam Costs

. . . in Increasing the General Efficiency of Machine Room and Boiler Room—

will Receive Valuable Suggestions through these Stickle Bulletins.

• Stickle Drainage for paper and board mills offers a choice in type of drainage best suited to operating conditions. It may be Stickle Individual Trap Drainage, Stickle Standard Differential Drainage, or Stickle Vacuum Differential Drainage. Whichever type is indicated, a Stickle Drainage System is built around Stickle time-tested drainage fundamentals, and adaptation to meet specific conditions achieves complete operating effectiveness. Installed, complete Stickle Drainage Systems supply maximum effectiveness for dryer drainage, which means maximum efficiency, in operation.

Stickle Automatic Control may he had in standard tension design or in combination tension and thermal control which eliminates manual attention to the greatest practical degree. Complete and instantaneous sensitivity permits Stickle control to conform to all demands created by variation in weight or slow or free drying stock, maintaining uniformity in quality, close control of moisture content, and high volume production.

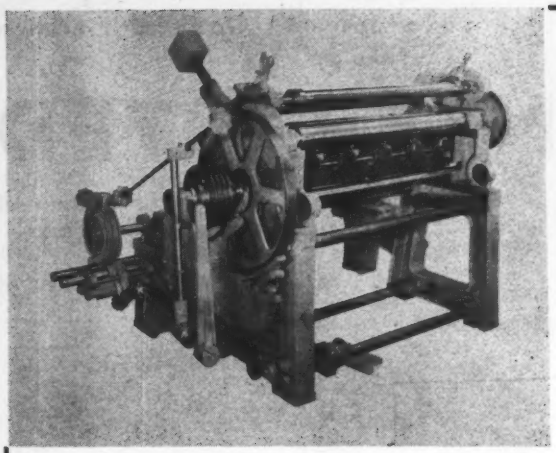
Stickle Boiler Return Systems permit condensate to be pumped back to boilers at a temperature corresponding to temperatures at which it leaves dryers. Stickle Blast Coil Heaters utilize B.T.U.'s from condensate to heat and ventilate machine room. Stickle Systems for elimination of B.T.U. waste quickly amortize their cost in the reduction of steam cost.

Write for Stickle Bulletins No. 160 and No. 160-A for more detailed information.

STICKLE

STEAM SPECIALTIES COMPANY

2215 Valley Avenue **Indianapolis 1, Indiana**



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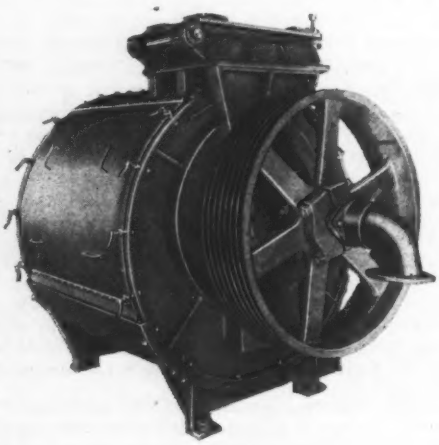

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